

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXIX: No. 1.

New York, Thursday, January 5, 1882.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## The Cowper Hot Blast Stove.

We show in the accompanying illustration a sectional elevation of a "Cowper" stove with downcomer, and a short description of the same. The stoves are fire-brick stoves, with regenerators very like those used in the Siemens furnaces, but are made of such large capacity that they will work well at four-hour shifts and give a very uniform temperature of blast—in fact, more uniform than is commonly obtained from cast-iron pipe stoves. Each stove is alternately heated by the combustion of the waste gas from the top of the blast furnace, and then is made to heat the blast as it enters at the bottom and ascends through the stove. The air-tight casings of the stove are of wrought iron to retain the heat, and are lined with brick to retain the heat. While heating up the stove the flame passes up the cylindrical flame flue on a compact mass of high temperature, and turns over under the single fire-brick covering dome and passes down through the numerous passages of the regenerator fire-brick P, and thus heats it up to a high temperature, the heat gradually penetrating downwards as each layer of brickwork becomes fully heated, the heat being stratified, so to speak, from the lower always being the cooler part, so that there is no tendency for the hot and cold air to mix. When the blast is being heated it is brought in at the bottom, and gradually ascends as it becomes heated, so that the very tendency of the apparatus itself is to prevent any cooler air becoming mixed with hotter air, and thus lower the temperature of the issuing hot blast. The waste gas from the top of the blast furnace is brought down by a peculiar "down-comer," X, which catches a large proportion of the dust that comes over with the gas, the gas passing down a central tube, and then issuing through holes in that tube into an outside tube, while much of the dust goes straight down into a pocket, in which it is caught; the gas descending still lower, again enters the central tube through other holes, while a further portion of fine dust is deposited in a pocket formed by the outside tube; the gas then passes down through an underground flue to the underside of the gas valve, where it enters the stove through a peculiar burner, which allows of three flat sheets of gas passing upward, while atmospheric air is permitted to pass in horizontally between and around these sheets of gas, so that a most intimate mixture rapidly takes place, and thus insures a good full, round flame of high temperature being produced in the flame flue, with which to heat the stove. One result of the products of combustion, or rather flame, being at a very high temperature on ascending, and being cold on descending, is that the stove makes its own natural draft, acting exactly like a syphon, and thus drawing in air and gas and expelling the thoroughly cooled products of combustion at the chimney valve; the friction through the stove is very little indeed—in fact, far less than through any other stove.

The cylindrical flame flue is on one side of the stove, and the chimney valve D on the other side, so that the distance traveled by the air is nearly the same through any passage, and tiles with definite sized openings in them are placed over every passage to cause perfect distribution. Any light or very fine dust that may settle in the stove is easily blown out at tapping time by arranging a door on the gas valve or manhole, to be opened quickly by two men at a long lever when the stove is full of blast at full pressure—all valves but the cold blast being shut—as then a sudden outburst of compressed air comes out, bringing with it the dust. This is a most efficient plan, and if any dust should hang at all in the stove, it is easily removed by a few slight puffs of gunpowder from a gun once a month; there is no stoppage whatever of the stoves for cleaning, and stoves have run for two years perfectly without being opened, and when opened have been found to be in perfect condition. There is, it would seem, little or no wear and tear in the stoves, as the bricks are unaffected after being used for many years, and wrought-iron casings never want a rivet touching, as they are not subjected to any great heat, being protected by the lining of the brickwork. A large number of these stoves have been in operation for some years in England, Wales, France, Germany, Switzerland and America, and, no doubt, will be in blast even in China at no very distant date. The stoves heat the blast to 1500° F. The stoves can be made of any reasonable size, as the bricks stand fairly one upon another. One advantage resulting from the regularity of temperature of the blast during the time of heating is that but one stove need be in use at a time, and therefore one pair of stoves is enough for two furnaces. In our illustration A is the gas flue from the furnace; B, the manhole for cleaning out dust; V, gas flue; E, hot-blast valve; G, air valve; F, gas valve; S, sight hole; D, chimney valve; U, chimney flue; T, gallery. In our next issue we shall give a plan for the arrangement of a pair of these stoves.

V. Henry Rothschild, a merchant in Leonard street, for whom an immense iron building on the corner of that street and West Broadway has just been completed, has had a bridge 45 feet long constructed from an upper story of the new building across Leonard street to the old quarters of the firm, and over this, which has covered sides and is held up by iron trusses, the removal of the stock and other property is being made,

## Magazines for Explosives.

Capt. Philip Hess, of the Austrian Imperial Engineers, has been for some time experimenting on the best materials for constructing magazines and factories of explosive material, and for protecting them from fire. The generally prevailing idea that such buildings should be made very strong, with thick walls, is entirely dismissed. No walls will resist the force of the explosives; an explosion cannot be shut in; and if it is to occur, provision must be made that it shall do as little mischief as possible. Falling fragments are the great source of danger; and the heavier these are, the more harm will be

for dynamite factories. A very safe roofing can be constructed with the old tar compound (often called asphalt), which was tested at experiments conducted by the Prussian authorities at Neustadt-Eberswalde in 1854, and by the Austrians at Graupen bei Teplitz in 1875, and has been retained wherever adopted. Its maintenance is, however, difficult and expensive, because the tar and other kindred substances which it contains are easily volatilized under the action of the sun's light and heat. In order to prevent this as far as possible, sand, gravel and cement are usually employed; but it is evident that the material is only suitable to horizontal or gently inclined surfaces, and that

rubbed with the hand; afterward, a copper cylinder was heated to a clear red glow, laid on the prepared side of the slabs and left there until cool; and lastly, a jet of flame from a blow-pipe was applied alternately several times to both surfaces. These tests were applied to various preparations, and the general result was that water-glass formed the basis of all that were satisfactory, combined with such substances as would form indissoluble silicates on the surface of the wood. Such are powdered slate, brick-dust, powdered chalk, flint, hydraulic lime and cement, and many others. Saturated solution of water glass, diluted with an equal volume of water, was applied, and before it

when used in dynamite factories, it requires to be whitewashed when it grows dark from exposure, for the sake of coolness in summer. A preparation of oxychloride of zinc proved about equally effectual with the lime composition. Captain Hess does not consider he has by any means exhausted the subject, and thinks that experiments with magnesia cement, mixtures of water glass with powdered slag, feldspar, various hydraulic limes and cements, Scott's selenitic mortar, and other similar preparations, might be made with advantage. The power of resistance to frost can be well tested when frost is not at command by wetting the surface profusely, and then suddenly evaporating the water by the application of the blow-pipe flame. He has found that the disintegrating fairly corresponds to frost; but the Portland cement preparation appears to be the only one which he has submitted to this test. It withstood it satisfactorily, as well as that of the actual frost itself. None of these compositions should be used in the interior of the magazine itself, or in the work rooms of the factories, on account of the danger of friction from crumbling morsels.

## National Board of Trade.

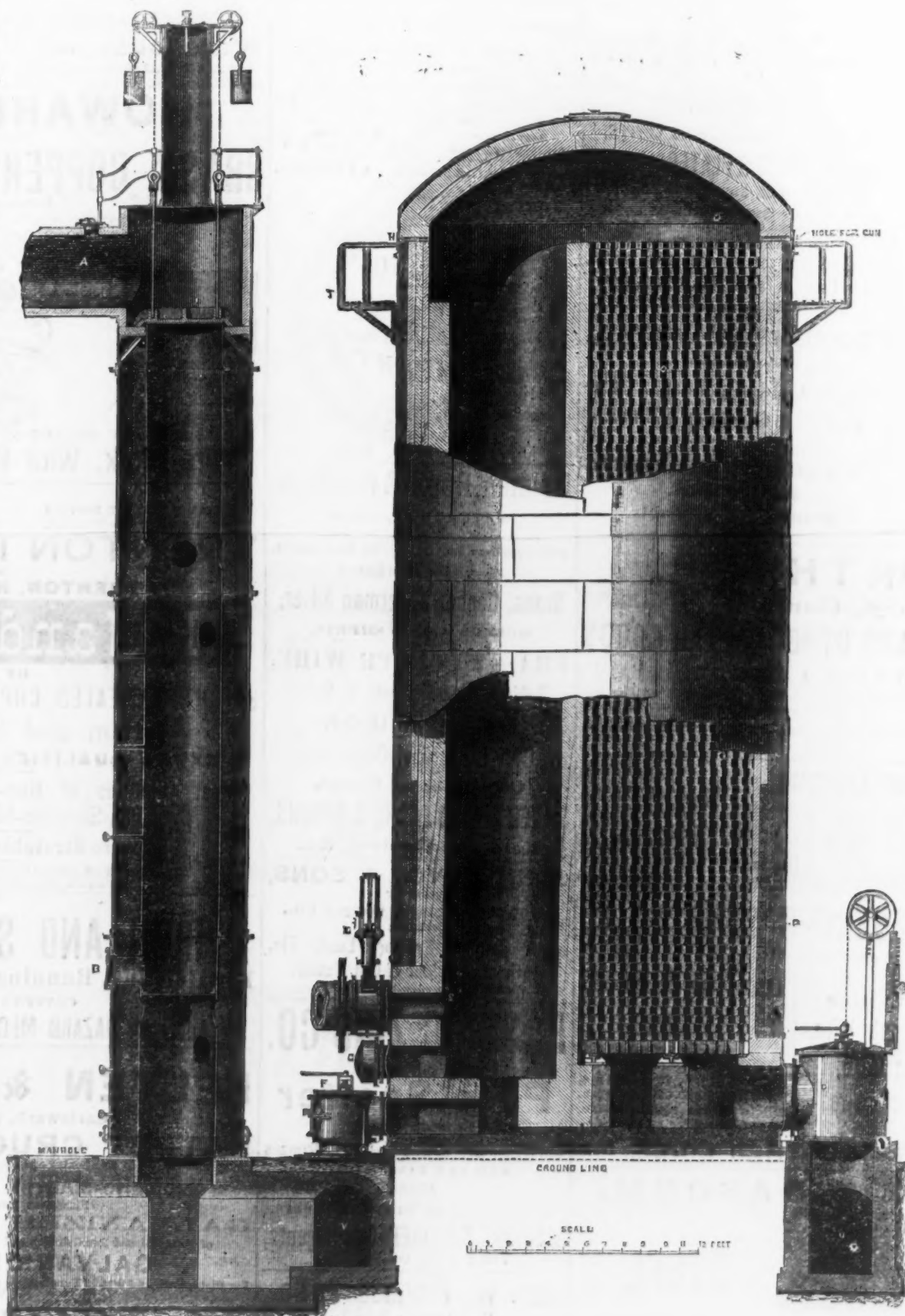
The official programme of the recommendations and resolutions to be considered at the coming annual meeting of the National Board of Trade, has just been prepared and issued. The convention is to be held in Washington, beginning on the 13th inst. Reports will first be received from special committees appointed at the last convention to consider the adulteration of food and drugs, trade relations with Canada and the pilotage service. Resolutions submitted by boards of trade and chambers of commerce in various cities in the country will be taken up in the following order and on the following subjects:

Security for advances on goods in transit; a national bankrupt law, on which three different recommendations have been made by the New York Board of Trade, the Baltimore Board of Trade and the Philadelphia Board of Trade; a department of commerce as a branch of the general government; a definite constitutional method for settling disputed Presidential elections and successions; the frequency of Presidential elections and the disturbance of the business of the country; measures to secure a speedier hearing of causes in the United States Supreme Court; increased diplomatic and consular service to meet the needs of our growing export interests; the requirements of a postal telegraph system as successfully used in Great Britain; a permanent national railroad commission established by the general government, to supervise common carriers in the interest of the public, to act in harmony with and auxiliary to the various State commissions; a United States Navy adequate for the protection of our sea coasts, the interests of American shipping requiring the removal of local taxation, reciprocity in the matter of light dues in foreign ports and the reasonable subsidizing of mail lines to promote commercial intercourse with all important regions of the globe; revision of the revenue and tariff laws by a repeal of all internal taxes, except on whiskey and tobacco, and the appointment of a commission of experts to prepare a tariff more accurate, effective and suitable to the present conditions of American industries, and return of the balance of the Japanese indemnity fund after the actual damages sustained by citizens of the United States have been paid.

## The United States Torpedo Service.

The reports recently published from the departments at Washington state that very useful work has been done at the Torpedo Station, which has turned out a class of officers well instructed in the elements of torpedo attack and defense. A new torpedo, lately purchased by the department, shows a very considerable excess of speed above those previously furnished, and another movable torpedo has been experimented with. Extensive researches have been made into systems of defense of vessels against torpedoes, both by means of obstructions and by the electric light. Experiments are also being made with a view to the introduction of a higher explosive than gunpowder into the torpedo service. The impression prevails in some quarters that torpedoes alone would suffice for the defense of our coast against a hostile fleet. This view is not sustained. Torpedoes, either for defense or attack, must be covered and defended by the fire of powerful rifled guns, both afloat and ashore. There are various methods in vogue for the destruction and removal of hostile torpedoes, and these appliances are being constantly perfected. In view of this state of affairs it would be rash, indeed, to place our reliance upon torpedoes alone. The two destructive agents (artillery and torpedoes) supplement each other, and, as a rule, must be employed together.

Although New York has a number of illuminated clocks, scarcely any of them have dial plates easily read at night, except by persons of decidedly strong sight. One of the best night clocks in existence is that at the Horse Guards Building in London. The light, known as the Bude light, is not within the clock, but is thrown upon it, just as that of a bull's-eye lantern is thrown on a dark corner. This light was invented by a Cornish savant, Sir Goldsmith Gurney, who called it Bude after his native place.



THE COWPER HOT BLAST STOVE.

done. Such buildings ought, therefore, to be made of the lightest possible material, and where they can be situated in the midst of, high and thick trees a valuable protection is obtained. Wood has, however, the drawback of being easily inflammable, and as explosives are frequently stored for convenience of use near the works where they are employed, which nearly always implies the neighborhood of fires of some sort, it is necessary to protect it against flying sparks. Precautions are also needed against fire originating within the building. With the former object, a roof of sheet metal is sometimes used; but this, though efficacious, is as dangerous in case of explosion as stone; is in many localities expensive, and in hot weather becomes itself a source of danger

other means must be sought for the protection of the walls. The asbestos pasteboard of the Roman Asbestos Company is an excellent material, being unflamable, weather-proof, a bad conductor, and a good absorbent of heat; but it is very expensive, and at present is not made any thinner than 1 mm. If it were prepared of half the thickness, it might be used economically and with effect. Since no covering material exists, which is in every respect satisfactory, Captain Hess instituted a series of experiments upon preparations for impregnating wood so as to render it impervious to weather and unsuceptible of kindling. Slabs of soft wood were coated with the material to be tested; each was kept for fifteen minutes under a stream of water, and

had cooled, finely-powdered black slate was sprinkled on it. When dry, all loose powder was brushed away and the process twice repeated. This composition stood the test of water and hot metal, but sealed off under the blow-pipe flame. Substituting brick-dust for the slate, the result was very unsatisfactory, as, after 14 days, it would resist neither the action of the water nor the blow-pipe. A similar composition made with lime, on the contrary, proved excellent, withstanding all the tests after three days' hardening. The blow-pipe flame was applied until the prepared surface glowed and sank into the charred wood underneath; but there was still no approach to kindling. Portland cement, applied over a coating of water glass, proved even better than the preceding; but



**Metals.**  
**ANSONIA**  
**BRASS & COPPER CO.,**  
 No. 19 CHURCH STREET,  
 NEW YORK.  
 MANUFACTURERS OF

**BRASS AND COPPER**

Sheets, Bolts, Rods, Wire, &c.  
**Seamless Brass & Copper**  
**Tubing.**

Ansonia Corrugated Stove Platforms.  
**PURE COPPER WIRE**

For Electrical Purposes, Bare and Covered.  
 Phosphor Bronze Rods for Pumps, &c.

**ANSONIA ★ REFINED**  
**INCOT COPPER.**

**PHELPS, DODGE & CO.**

IMPORTERS OF  
**TIN PLATE,**

**ROOFING PLATE,**

Sheet Iron, Copper, Pig Tin Wire,

Zinc, &c.

MANUFACTURERS OF  
**COPPER AND BRASS.**

CLIFF STREET, NEW YORK.

**SCOVILL MFG CO**

**BRASS,**  
**HINGES, WIRE, GERMAN SILVER.**

**PHOTOGRAPHIC GOODS.**

**BUTTONS,**  
**CLOTH AND METAL.**

DEPOTS, 419 & 421 Broome St., N. Y.  
 177 Devonshire St., Boston.  
 183 Lake St., Chicago.

FACTORIES,  
 Waterbury, Conn.  
 New Haven, Conn.  
 New York City.

**DICKERSON, VAN DUSEN & CO.,**

Importers of  
 Tin Plate, Pig Tin, Sheet Iron, Copper,

Wire, Zinc, Etc.

22 & 21 CURTIS ST., cor. Fulton,  
 DICKERSON & CO., Liverpool. NEW YORK.

**A. C. NORTHROP,**

Waterbury, Conn.,

**NOVELTIES IN BRASS AND OTHER METAL GOODS**

FOR HARDWARE TRADE.

Wrought Iron and Brass Machine Screws; Turned, Hexagon, Round and Square Head Cap and

Set Screws; Brass and Iron Safety and Jack Chain; Gilt, Nickel Plated and Bronze Trimmings of all

kinds, from Sheet Iron, Steel or Brass.

Estimates on patented articles, or any description of Sheet Metal work, respectfully solicited and

promptly given.

**WORKS**

AT

**TRENTON,**

N. J.

**THE JOHN A. ROEBLING'S SONS CO.,**

MANUFACTURERS OF

**WIRE ROPE**

OF

Iron, Steel and Copper,

FOR

Hoisting Purposes of all

kinds, for Ferries, Stays,

Ship Rigging, Sash Cords,

Lightning Rods, &c., &c.

Suspension Bridge Cables.

**GALVANIZED WIRE CLOTHES LINES.**

**BRODERICK & BASCOM,**

MANUFACTURERS OF

**IRON**

**WIRE ROPE.**

728 N. Main St.,

St. Louis, Mo.

**WORCESTER WIRE CO.,**

Manufacturers of

**IRON AND STEEL**

**WIRE**

For all Purposes.

**WORCESTER MASS.**

**Metals.**  
  
**Waterbury Brass Co.**  
 CAPITAL, - - \$400,000.  
 Sheet, Roll and Platers' Brass,  
 GERMAN SILVER,  
 Copper, Brass and German Silver Wire,  
 BRASS AND COPPER TUBING,  
**COPPER RIVETS & BURS,**  
**BRASS KETTLES,**  
**Door Rail, Brass Tags,**  
**PERCUSSION CAPS,**  
**POWDER FLASKS.**  
 Metallic Eyelets, Shot Pouches, Tape Measures, &c.  
 And small Brass Wares of every Description.  
 Cartridge Metal in Sheets or Shells a Specialty.  
 Sole Agents for the

**Capewell Mfg. Co.'s Line of Sport-**

**ing Goods.**

DEPOTS: 296 Broadway, New York,  
 125 Eddy St., Providence, R. I.

MILLS AT  
 WATERBURY,  
 Conn.

**Detroit Copper & Brass**

**Rolling Mills.**

BRAZIER'S AND SHEATHING COPPER,

ROLLED, SHEET & PLATERS' BRASS

GERMAN OR NICKEL SILVER,

Copper Wire for Electrical and other purposes,  
 Brass and German Silver Wire,

Copper Rivets and Burs,

COPPER BOTTOMS FOR TEA KETTLES AND BOILERS,  
 Cor. Larned & Fourth Sts., Detroit, Mich.

**ROME IRON WORKS,**

Manufacturers of

**Brass, Gilding Metal, Cop-**

**per and German Silver**

(In Sheets, Rods, Tubing or Wire),

**COPPER & BRASS RIVETS**

**AND BURS.**

**Rome, New York.**

**STANDARD WIRE**

**HARRISON**

**WIRE**

**COMPANY.**

ST. LOUIS, MO.

**Holmes, Booth & Haydens,**

**WATERBURY, CONN.**

NEW YORK 49 Chambers St. BOSTON 18 Federal St.

Manufacturers of all kinds of

**Brass, Copper & German Silver,**

**ROLLED AND IN SHEETS.**

**BRASS & COPPER WIRE,**

**Tubing, Copper Rivets & Burs.**

**BRASS & IRON**

**JACK CHAIN, DOOR RAIL.**

**German Silver Spoons,**

**SILVER PLATED FORKS & SPOONS,**

**Kerosene Burners, &c.**

**JOHN DAVOL & SONS,**

Agents for

**Brooklyn Brass & Copper Co.,**

Dealers in

Ingot Copper, Spelter, Lead, Tin,

Antimony, Solder & Old Metals.

100 John Street, New York.

**PASSAIC ZINC CO.**

Manufacturers of

**Pure Spelter**

FOR

Cartridge Brass, Gas Fixtures, Bronzes

AND ALL FINE WORK.

Also for

**Galvanizers & Brass Founders.**

**MANNING & SQUIER, Gen'l Agents,**

113 Liberty Street, N. Y.

**Geo. W. Prentiss & Co.,**

HOLYOKE, MASS.,

MANUFACTURERS OF

**IRON**

**WIRE.**

Bright, Coppered, Annealed and Tin

Plated. Also GUN SCREW WIRE

Of all sizes straightened and cut to order.

**The Schoenberg Metal Mfg. Co.,**

Manufacturers of and Dealers in

**SOLDER, TYPE,**

Stereotype, Electrotype and Babbitt Metals,

Importers of Block Tin, Antimony, &c. Refiners of

Lead, Spelter, &c. Highest price paid for Old Metals

and all kinds of Brass. 528 and 530 West 20th

Street, between Avenues A & B, New York.

**Metals.**  
**The Plume & Atwood**  
**Mfg. Company,**  
 MANUFACTURERS OF

**SHEET and ROLL BRASS and WIRE,**

German Silver and Gilding Metal,

**Copper Rivets and Burs,**

**Kerosene Burners,**

**Lamp Trimmings, &c.**

18 Murray Street, New York.

13 Federal Street, Boston.

109 Lake Street, Chicago.

Rolling Mill, Factories,  
 THOMASTON, CT. WATERBURY, CT.

**Bridgeport Brass Co.,**

MANUFACTURERS OF

Sheet and Roll Brass,

Brass & Copper Wire & Tubing,

German Silver Metal and Wire,

Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,

LANTERNS and TRIMMINGS, KEROSENE BURNERS,

Clocks & Fly Fan Movements, PLUMBERS' MATERIALS.

Particular attention paid to cutting out Blanks and

manufacturing Metal Goods.

MANUFACTORY, BRIDGEPORT, CONN. WAREHOUSE, 19 Murray St., N. Y.

THOS. W. FITCH, Pres. and Treas. A. A. LASAR, Secy.

**WIRE, etc.**

**PHILIP L. MOEN, President and Treasurer. CHAS. F. WASHBURN, Vice President & Secretary.**

**WASHBURN & MOEN MANUFACTURING CO.**

Established 1831.

WORCESTER, MASS.

**IRON and STEEL WIRE,**

Patent Steel Barb Fencing, Patent Steel Wire Bale Ties.

WIRE RODS of all Grades: Round iron, rivet quality, 1/4 in. to 4 in., cut to any length. Owners and exclu-

sive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE, in

coils of 100 pounds, without seam or weld. Patent Galvanized Telegraph Wire, Market and Stone Wire,

Annealed Fence and Grape Wire in long lengths: Coppered Rail-Spall Wire; Rope, Bridge, Bolt, Screw, Rivet, Buckle

and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds, &c. Piano-string Covering Wire,

Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and

Spiral Spring Wire, and Refined Wire to Patterns for particular purposes, from selected stamps of Norway Iron.

Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,

Straightened and Cut to any length. Steel Crapline Wire, Patent Lumber Nail. Unpatented Steel Music

Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

St. Louis Warehouse, 802 North 2d St.

Chicago Warehouse, 107 Lake St.

WAREHOUSE, 21 Cliff Street, New York.

'NATIONAL WIRE AND LANTERN WORKS,'

**Warehouse, 45 Fulton Street, New York.**

And California Wire Works Co., San Francisco, Cal.

Manufactory, Nos. 1197, 1199, 1201, 1203, 1205, 1207, 1209 and 1211 De Kalb Avenue, Brooklyn, N. Y.

**HOWARD & MORSE,**

MANUFACTURERS OF

**BRASS, COPPER & IRON WIRE CLOTH,**

Exclusive Manufacturers of the

**WIRE CLOTH, partly**

**unrolled.**

**HEAVY ROLLED CLOTH FOR MALT KILN FLOORS.**

**Wire Work, Wire Fence, Railing and Guards.**

ABRAM S. HEWITT, President. WM. HEWITT, Vice President.

**THE TRENTON IRON COMPANY,**

(INCORPORATED 1847),

**TRENTON, N. J., Manufacturers of**

**IRON and STEEL WIRE**

OF ALL GRADES,

**BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED;**

**Iron and Steel Wire Rods;**

**EXTRA QUALITIES OF BAR IRON AND RODS.**

Best Qualities of Gun-Screw and Charcoal Iron Wire;

Crucible, Siemens-Martin and Bessemer Steel Wire.

Wire Straightened and Cut to Lengths.

New York Office, COOPER, HEWITT & CO., 17 Burling Slip.

Philadelphia Office, JOHN HEWITT, Agent, 21 North Fourth St.

**IRON AND STEEL WIRE ROPE**

For Hoisting, Running & Standing Ropes, Ferries, &c

CONSTANTLY KEPT ON HAND.

Address: HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

**FELTEN & GUILLEAUME,**

Carlswork, near Cologne, Germany.

**PATENT CRUCIBLE STEEL WIRE,**

For Mining and Flow Ropes, Hawers and Bridge Cables.

**SIEMENS-MARTIN AND BESSEMER STEEL WIRE,**

Flussisen, Swedish and German Charcoal Wire.

**GALVANIZED TELEGRAPH WIRE**

of Charcoal and Swedish Iron and Steel, also with high conductivity, and in long lengths.

**GALVANIZED STEEL WIRE,**

For Plain, Barb and Strand Fencing, 3, 4 and 7-ply Strand, Staples, &c. Annealed and Oiled Fencing

Wire, round and oval.

**WIRE ROPE**

OF EVERY DESCRIPTION.

**TELEGRAPH CABLES.**

Contractors to the German and Foreign governments. The oldest house in the branch on the Con-

tinental. Telegraph Address, CARLSWERK, COLOGNE.

General Agents for U. S. and Canada,

**PERKINS & CHOATE, 23 Nassau St., N. Y.**

**A. LESCHEN & SON,**

Manufacturers of

**WIRE ROPE**

OF EVERY DESCRIPTION.

919 to 923 N. Main St., ST. LOUIS, MO.

Correspondence invited.

214 and

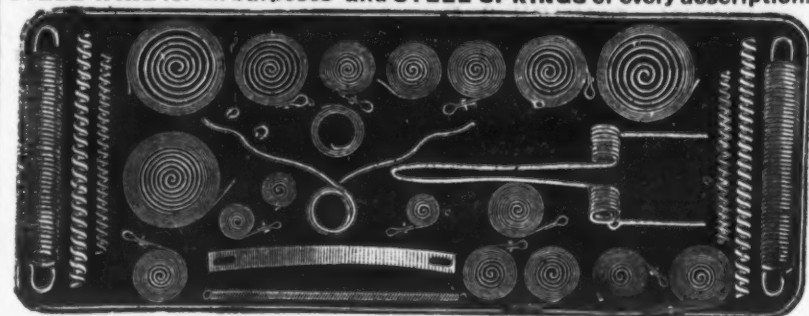




**O. LINDEMANN & CO.,**  
Manufacturers of all kinds of  
Japanned, Brass &  
Tin Plated  
**BIRD CAGES.**  
Catalogues furnished to the trade.  
**254 Pearl St., NEW YORK.**

## CARY & MOEN,

Manufacturers of  
**STEEL WIRE for all purposes and STEEL SPRINGS of every description.**



Market Steel Wire, Crinoline Wire, tempered and covered.  
Also Patent Tempered Steel Furniture Springs, constantly on hand.  
234, 236 and 238 West 29th Street, NEW YORK.

## LIGHT HOISTING MACHINERY.

New Catalogue Just Issued. Sent Free on Application.

## YALE LOCK MFG. CO.

Office and Works,  
**STAMFORD, CONN.**

Salesrooms,  
New York, 53 Chambers Street,  
Boston, 36 Pearl Street,  
Philadelphia, 507 Market Street,  
Chicago, 64 Lake Street.

## BROWN & BROTHERS,

81 Chambers St., N. Y. Waterbury, Conn.  
Manufacturers of

## BRASS, COPPER AND GERMAN SILVER,

In Sheets, Rolls, Rods, Wire, Tubing.  
Rivets and Burs, Etc.

ALSO,

## Seamless Brass & Copper Tubing.

PATENTED SEAMLESS BRASS AND COPPER  
HOUSE BOILERS, warranted to stand 50 lbs.  
pressure and guaranteed against vacuum.

PATENTED SPRING TEMPERED SHANK,  
SILVER-PLATED, FLAT TABLE WARE, in rich  
designs.

GERMAN SILVER SPOONS AND FORKS.

## POPE, COLE & Co.

## BALTIMORE COPPER WORKS,

No. 57 South Gay St., BALTIMORE, MD.,

Have always on hand and for sale

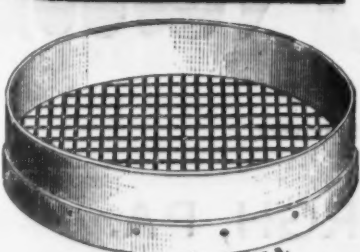
## INGOT COPPER,

Also Cakes, of unequalled purity and toughness.

## RIDDLES AND CASTING BRUSHES

a specialty. Superior goods and reasonable prices.  
Send for prices.

**E. T. BARNUM, Detroit, Mich.**



## G. Gunther,

Manufacturer of  
Patented Brass, Silver Plated  
and Japanned  
**BIRD CAGES.**

Can be nested for ex-  
port shipments.

**46 Park Place, NEW YORK.**

Largest variety in patterns and unsurpassed in  
low prices. New Illustrated Catalogues and Price  
Lists on application.

## Schenectady Molding Sand Co.

**ALBANY AND SCHENECTADY MOLDING SAND**  
delivered on cars or boats at low rates. All grades  
guaranteed. All orders will receive prompt atten-  
tion. Address, **J. G. GREENE & Co.,**  
28 Wall St., SCHENECTADY, N. Y.

## The Morris Sash Lock Mfg. Co.

Manufacturers of  
**The Morris Sash Lock,**  
Pat. Self-Locking Sash Lift & Lock,  
Pat. Self-Locking Shutter Bar,  
And specialties in Builders' Hardware.  
214 and 216 ELN STREET CINCINNATI, OHIO, U. S. A.

## GAUTIER STEEL DEPARTMENT

OF THE  
**CAMBRIA IRON CO.,**

PHILIP E. CHAPIN, Gen'l Supt.

## STEEL, WIRE and SPRINGS.

JOHNSTOWN, PENN.

N. Y. Store, - 81 JOHN STREET.

Phila. Store, - 523 ARCH STREET.

## MOULDING SAND. Albany Sand a Specialty. FOUNDRY FACINGS, Shovels, Riddles, Brushes, &c.

**WHITEHEAD BROS. AMERICAN FACING CO.**

**WM. WHITEHEAD, Treas.,**  
517 W. 15th St., New York.

## FACING J. A. EMERICK & CO. 1056 & 1076 Beach Street, PHILADELPHIA, MANFRS' FOUNDRY FACINGS, MOLDING SANDS and Foundry Supplies.

## N. & G. TAYLOR CO., PHILADELPHIA, ODD AND REGULAR SIZES TIN AND ROOFING PLATES,

Black and Galvanized Sheet Iron, Metals, Wire, Copper,  
Stamped Ware, Registers, &c.

## Annual Review of the Metal Market for 1881.

The year 1881 may be called a prosperous one wherever metals are produced or consumed. While the output has been everywhere ample, consumption has had little difficulty in coping with it, in consequence of the general revival in active trade, only to a moderate extent assisted by speculation. In this respect—i. e., the comparative absence of speculation, except in Tin—1881 has differed materially from 1879, when in October a general greatly speculative effervescence took hold of nearly every article in the list, including metals, and kept it high during five successive months. This year the advance has been gradual since summer, and in all metals, always excepting Tin, was based on an unexpected expansion of actual absorption, and therefore needed no speculation to help it. General business improved as well and as steadily in Europe—despite a rising discount—as in this country, as the year advanced, and all people in the trade feel and know that the movement was a sound one, deserving confidence. Nor are the prospects any less promising for the near future. On both sides of the Atlantic great impulse has been given to all sorts of public works and private enterprises. Capital reverts to useful undertakings and industrial values probably rest on a safer basis than they have done for eight years past. Much of this happy change is due, so far as Europe is concerned, to the quiet aspect of international politics and to the greater facilities of intercourse which have grown up during late years, and will receive important additions on the Continent in 1882.

COURSE OF PRICES AT NEW YORK.—CENTS PER POUND.—15 GOLD.

	July 1, 1879.	Jan. 1, 1880.	Nov. 1, 1880.	Dec. 29, 1881.
Lake Copper...	16	21 1/2	19 1/2	21
Straits Tin...	31 1/2	34 1/2	34 1/2	34 1/2
Domestic Lead...	4	5	4 1/2	5 1/2
Spelter...	7 1/2	4 1/2	6 1/2	6 1/2
Antimony...	12	18 1/2	15 1/2	14 1/2
Coke Tin, pr. bx.	\$5 1/2	\$5 1/2	\$5	\$5 1/2

### Copper.

The year opened with a quiet, but firm, feeling at 19 1/2¢ for Lake Superior, the price gradually hardening, although sales did not exceed 750,000 lb, closing at 19 1/2¢. It was shown that the production of Lake Superior reached, in 1880, no less than 49,000,000 lb, but that this quantity, large as it was, was absorbed by domestic consumption without difficulty. London opened with Chili Bars at £62, and Best Selected £67. Charters on the West Coast have been only 41,500 tons in 1880, against 50,600 in 1879, 48,000 in 1878, 44,000 in 1877, 49,000 in 1876, 48,000 in 1875 and 1874. During the month news was received from Peru that Lima was captured by the Chilians on January 17, and many people entertained hopes that the war would soon draw to a close, restoring Chili to full productivity, the falling off in the output of Copper for 1880 amounting to 15,000 tons. The range of Chili Bars in London during 1880 had been £55 @ £70, 10/; in 1879, £54 @ £68; in 1878, £55 @ £66; in 1877, £64 @ £73, 10/; and in 1876, £71, 10/ @ £81, 10/. February was again a quiet month, sales being restricted to 500,000 lb at 19 1/2¢ @ 19 1/2¢, closing at the outside figure. The winter being of unusual severity, traffic in the interior was considerably hampered, causing great dullness in trade. Activity in the manufacturing regions, nevertheless, suffered little interruption during the month. In Europe Chili Bars kept steady at £62, 10/, it becoming evident that the fall of Lima would not hasten the conclusion of peace on the West Coast. Sales at New York in March were again limited to 1,000,000 lb, prices weakening a little as the month advanced, and giving way gradually from 19 1/2¢ to 19 1/2¢ @ 19 1/2¢. Manufacturing, meanwhile, went on satisfactorily, the impression being strengthened thereby that prices would not be sustained by a continued large home demand, notwithstanding the reduced export of Copper. There had, indeed, been more Copper imported in 1880 than exported, the export only being 326,152 lb, against 13,402,332 in 1879, and the import 4,540,671, against 1,123,428. From Spain news was received that Rio Tinto Copper exportation had been about the same in 1880 as the previous year. In April the market became still duller, sales not exceeding 500,000 lb at 18 1/2¢ @ 18 1/2¢, closing at the latter figure. The chief companies on Lake Superior at this time resolved to give relief to the situation by an export sale of 2000 to 4000 tons at equal to 185 francs @ 100 kg., deliverable at Havre. London had meanwhile gradually declined to £59 with Chili Bars, and £66 best Selected. In May the nearness of a fresh supply from the Lake region caused manufacturers to withdraw from the market for the time being; in this manner their purchases were limited to 1,000,000 lb, the month opening at 19¢, and closing at 18 1/2¢. News came to hand from Spain to the effect that, although the Rio Tinto Copper Company had produced no more Copper than in 1879, it had been able to declare a dividend of 8% instead of 5% for the previous season. England's import of precipitate and pyrites reduced to pure Copper was shown to have been as much as 34,652 tons in 1880, against 30,109 in 1879, 27,616 in 1878, and 27,002 in 1877. At this time the increase in Copper production in New Mexico, Arizona and Montana came to be much discussed at New York, and as certain contracts with that region came to be known, the market was unfavorably influenced by the expected additional supply from there during the month of June, when, from opening at 18 1/2¢, the price of Lake Superior suddenly dropped to 16 1/2¢ toward the close, with sales of 1,200,000 lb. London, meanwhile, gave way with Chili Bars to £58, the stock being 58,557 tons, against 65,000 tons the previous year, when the price was £56. Early in July a number of manufacturers, the leading ones among them, availed themselves of the dull feeling and depression to perfect extensive contracts with producers to the amount of some 20,000,000 lb, deliverable all the way to the close of the season at the extremely low price of 16¢, followed in the course of the month by some straggling sales of a couple of hundred thousand pounds at 16 1/2¢ @ 16 1/2¢. Meanwhile it was shown that the charters on the West Coast for the

twelve months ended June 30 had been only 35,250 tons, against 48,350 during the previous corresponding period, a decrease of about 13,000 tons. London thereupon recovered with Chili Bars to £59, 10/. In August there was but a moderate amount of activity, which did not prevent the tendency from becoming gradually an upward one. Although sales did not much exceed 500,000 lb, the price by degrees recovered from 16 1/2¢ to 16 1/2¢. In the manufacturing districts greater animation began to manifest itself, stimulated by the low price of the raw material. No inclination to speculate in Copper, even at these low figures, was shown at the centers of distribution; in this manner the situation remained sound, being deprived of all artificial and exciting elements, the exuberance of production being discounted by the low value. The advance noticed was, therefore, a natural rebound from extreme temporary depression. During the ensuing month this inclination of the metal to right itself made further and notable progress, and while this was the case it began to attract more attention, transactions during the month reaching 1,500,000 lb, taken by people who had not secured a supply in July, and the market thus by degrees rose from 16 1/2¢ early in September to 18 1/2¢ @ its close. Producers at this time being relieved of all embarrassing surplus, present and prospective, became indifferent about effecting any further sales except it were at still higher prices, and during the month the market recovered great firmness, the more so since in London also quite a recovery in values occurred, Chili Bars rising from £59, 10/ to £62, 10/. The fact was that in England and France the statistical position had gone on improving slightly, in view of the reduced shipments from the West Coast and the evidently threatening short supply from there as long as Chili should be compelled to keep a large army in the field in Peru and draw upon the mining population at home for enlistment in it. At the same time business in Europe gave unmistakable signs of growing improvement, and the demand for Copper increased there both for consumption and export. Thus a month or two had sufficed to radically change the position of the metal on both sides of the Atlantic; while there was no positive buoyancy in it yet, the metal trade began to look upon it as safe at prevailing rates. October, although rather less active than September at New York, sales hardly exceeding 1,000,000 lb, therefore evinced great steadiness within the range of 18¢ @ 18 1/2¢, while in London the price of Chili Bars advanced to £63, 10/. The improvement in Europe was not speculative, but wholly brought about by more doing and more reassuring statistics. There had meanwhile been exported from the United States during the first nine months 6,685,788 lb of Copper, against 312,371 lb during the corresponding period of the previous year. In November a speculative movement in the London market carried Chili Bars there to £66, 10/, while in our own 1,200,000 lb sold at hardening prices. Opening at 18 1/2¢, the market closed at 19 1/2¢. Consumption, in part for electrical purposes, was found to have increased enormously in the United States—so much so that it was estimated to have reached a figure which at the close of the year would probably not fall short of 70,000,000 lb. On the other hand, it was predicted that the Territories west of the Mississippi River alone would turn out in 1882 something like 20,000,000 to 25,000,000 lb. Yet much confidence was expressed that the increase of consumption would hold good for 1882 likewise, in which event we should be found capable of absorbing even these promised extra supplies from new sources. In Europe it meanwhile became evident that for 1881 no greater Chilian supply could be counted upon than 35,000 tons, instead of the average output of late years of 45,000 tons, but it was, on the other hand, hoped that Rio Tinto might furnish the shortcoming in the shape of a 10,000-ton excess for 1881. The New York market developed increased strength, leading to quite an advance during the last month of the year. The leading producer on the Lake had virtually become the master of the situation and was thus enabled to dictate terms. Consumers resigned themselves to subscribe to the prices demanded, and opening in December at 19 1/2¢, these gradually rose to 21¢, with sales of about 1,000,000 lb on the spot and 4,500,000 lb on private terms, deliverable in all January and February. The imports into the United States during the first 9 months of the year had been only 53,631 lb Ingot Copper, against 686,124 the previous year; the re-export, 27,570, against 42,532. The London market meanwhile ran up rapidly from £66, 10/; Chili Bars to £70, 10/, and Best Selected from £74 to £76. American production in 1880 was:

	Pounds.
Michigan.....	45,830,262
Maine.....	83,000
Maryland.....	164,640
Missouri.....	230,717
North Carolina.....	1,490,000
Pennsylvania.....	476,508
Vermont.....	2,647,804
Wisconsin.....	28,577
Colorado, Arizona, Idaho and California.	5,764,460
Total.....	56,855,648

VALUE OF INGOT COPPER AT NEW YORK IN CURRENCY

	1874.	1875.	1876.	1877.	1878.	1879.
January.....	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2
February.....	25	25	25	25	25	25
March.....	24 1/2	24 1/2	24 1/2	24 1/2	24 1/2	24 1/2
April.....	25	25	25	25	25	25
May.....	25	25	25	25	25	25
June.....	25	25	25	25	25	25
July.....	25	25	25	25	25	25
August.....	25	25	25	25	25	25
September.....	25	25	25	25	25	25
October.....	25	25	25	25	25	25
November.....	25	25	25	25	25	25
December.....	25	25	25	25	25	25

LOWEST AND HIGHEST PRICE OF LAKE SUPERIOR

	1880.	1881.
January.....	18 1/2	18 1/2
February.....	18 1/2	18 1/2
March.....	18 1/2	18 1/2
April.....	18 1/2	18 1/2
May.....	18 1/2	18 1/2
June.....	18 1/2	18 1/2
July.....	18 1/2	18 1/2
August.....	18 1/2	18 1/2
September.....	18 1/2	18 1/2
October.....	18 1/2	18 1/2
November.....	18 1/2	18 1/2
December.....	18 1/2	18 1/2

The year opened at New York with a visible supply of 5000 tons, and at 19¢ for Straits,



IRON.

NEW YORK.

**OGDEN & WALLACE,**  
85, 87, 89 & 91 Elm St., New York.  
**Iron and Steel**

very description kept in stock.

Agents for Park Brother & Co.'s  
**BLACK DIAMOND STEEL.**  
All sizes of Cast and Machinery Steel constantly on hand.**PIERSON & CO.,**

24 Broadway, New York City.

**Iron & Steel.**COMMON & REFINED IRON,  
Hoops, Rods, Scrolls, Bands, Ovals,  
Horse Shoe, Nail Rods,  
Steel, &c.

Orders promptly filled from stock.

**ABEEL BROTHERS,**  
Established 1754 by ABEEL & BYVANCK.**Iron Merchants,**

190 South Street and 365 Water, N. Y.

**ULSTER IRON**

A full assortment of all sizes constantly on hand.

Refined Iron,  
Horse-Shoe Iron,  
Common Iron,  
Band, Hoop and Scroll Iron,  
Sheet Iron,  
Norway Nail Rods,  
Cast, Spring and Tire Steel, etc.**A. R. WHITNEY & CO.,**  
Manufacturers of and Dealers in**IRON**Our specialty is in  
Manufacturing Iron Used in the Con-  
struction of Fire-Proof Buildings,  
Bridges, &c.Agent for  
Carnegie Bros. & Co., Limited, Pittsburgh,  
Pa., Wrought Iron Beams and  
Channel Iron.Bay State Iron Co., Boston, Mass., Boiler  
Plate and Tank Iron.Naylor & Co., Boston, Mass., Homogeneous  
Steel Plates and Compressed Steel  
Shafting.Plans and estimates furnished, and contracts  
made for erecting Iron Structures of every descrip-  
tion. Books containing cuts of all iron made sent  
on application by mail.Sample pieces at office. Please address  
65 Hudson Street, New York.**BORDEN & LOVELL,**  
**Commission Merchants**

70 &amp; 71 West St.,

New York.

Wm. Borden,  
L. R. Lovell,

Agents for the sale of

**Fall River Iron Co.'s Nails,**  
**Bands, Hoops & Rods.**

AND

**Borden Mining Company's**  
**Cumberland Coals.****WILLIAM H. WALLACE & CO.,**  
**IRON MERCHANTS**

Cor. Albany &amp; Washington Sts.

NEW YORK CITY.

M. H. WALLACE.

Wm. BISHAM.

**FOR SALE.**TWO UNMILLED ROLLS FOR A 16-INCH MILL.  
ABOUT 10 TONS 1½-IN. SQUARE BAR IRON.  
ABOUT 4 TONS 1½-IN. SQUARE BAR IRON.  
ABOUT 7 TONS 1½-IN. SQUARE BAR IRON.

Also, a small lot of other sizes by

**DANIEL W. RICHARDS & CO., 92 Mangin St., N. Y.****PASSAIC ROLLING MILL CO.,**  
Manufacture and have always in stock  
**ROLLED IRON BEAMS,**  
Channels, Angles, Tees, Merchant Bars, Riveted Work, For-  
gings, Eye Bars, &c.  
**PATERSON, N. J.**  
Room 45, Astor House, New York.**CUT NAILS,**

Hot Pressed Nuts, Bolts, Washers, &amp;c.

DOVER IRON CO.'S

**BOILER RIVETS,**

Boiler Brace Jaws, Socket Bolts, &amp;c.

**FULLER BROTHERS & CO.**

139 Greenwich Street, New York.

IRON.

NEW YORK.

**A. B. Warner & Son,**  
**IRON MERCHANTS,**  
28 & 29 West and 52 Washington Sts.  
**BOILER PLATE,**Boiler Tubes, Angle, Tee & Girder Iron  
Boiler and Tank Rivets.  
Sole Agents for the celebrated"Eureka," Pennocks,  
"Wawasset," Lukens,brands of Iron. Also: descriptions of Plate, Sheet,  
and Gasometer Iron. Special attention to Locomotive  
Iron. Fire Box Iron a specialty.**ROME MERCHANT IRON MILLS,**  
**ROME, N. Y.,**

Manufacturers of the best grade of

Bar Iron, Bands and Fine Hoops.  
Scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and  
Horse Shoe Iron. Also from Charcoal Pig a superior  
quality of Iron branded J. G. All puddled bars re-  
duced by hammer. Orders may be sent to the Mill or  
to J. O. CARPENTER, our Agent, at 59 John  
Street, New York.**RED CAR**  
**FOUNDRY PIG IRON**

In lots to suit. Also,

Old Rails, Scrap Iron, Crop Ends,  
Old Car Wheels, &c.**FOX & DRUMMOND,**  
**68 WALL ST., NEW YORK.****MARSHALL LEFFERTS & CO.,**  
**90 Beekman St., New York City,**MANUFACTURER AND DEALER.  
**Galvanized Sheet Iron,**

1st and 2d Qualities.

Galvanized Wire, Telegraph and Fence; Galvanized  
Hoop and Band Iron, Galvanized Rod and Bar Iron,  
Galvanized Nails, Galvanized Chain, Galvanized Iron  
Pipe.**CORRUGATED SHEET IRON**For Roofing, &c., Galvanized, Plain or Painted.  
Best Charcoal, Best Refined and Common  
**SHEET IRON.**Plate and Tank Iron,  
C No. 1, C H No. 1, C H No. 2 Flange, Best Flange  
Best Flange Fire Box, Circles.**BOILER IRON**Stamped and Guaranteed.  
All descriptions of Iron Work Galvanized or  
Tinned to order.  
Price list and quotations sent upon application.**JAMES WILLIAMSON & CO.,**  
**SCOTCH AND AMERICAN****PIG IRON,**  
**No. 69 Wall St., New York.****ULSTER IRON WORKS,**  
**90 Broadway, New York.****Tuckerman, Mulligan & Co****CARMICHAEL & EMMENS**  
**130, 132 & 134 Cedar St., New York.**DEALERS IN  
**IRON AND STEEL BOILER PLATE.**Lap-Welded Boiler Tubes, &c., &c.  
Agent for Olin's celebrated Cast Steel Boiler Plates,  
The Coatesville Iron Co., Pottstown Iron Co., The  
Laurel Rolling Mills, and Union Tube Works; Wrought  
Iron Beams, Angles, Tees, Rivets, &c.

IRON.

NEW YORK.

**JOHN W. QUINCY & CO.,**  
**98 William Street, New York.**Anthracite & Charcoal Pig Irons,  
Wrought Scrap, Cut Nails, Copper,  
BLOCK TIN, LEAD, SPelter, ANTIMONY, NICKEL, &c.**HARRISON & GILLOON**  
**IRON AND METAL DEALERS,**  
**555, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST.,**  
**NEW YORK.**have on hand, and offer for sale, the following:  
Scotch and American Pig Iron, Wrought, Cast and  
Machinery Scrap Iron, Car-Wheels, Axles and Heavy  
Wrought Iron; also old Copper, Composition, Brass,  
Lead, Pewter, Zinc, &c.**OXFORD IRON CO.,**  
**(B. G. CLARKE, Receiver,)****Cut Nails**

AND

**SPIKES.****J. S. SCRANTON, Sales Agent,**  
**81, 83 and 85 Washington Street,**  
**NEW YORK.****BURDEN'S****HORSE SHOES.****"Burden Best"****Iron****Boiler Rivets.**

The Burden Iron Company

Troy, N. Y.

**ULSTER****BURDEN'S****H. B. & S. Bar Iron.**Also Best Grades of  
American & English Refined Iron.

All sizes and shapes in stock.

**EGLESTON BROS. & CO.,**  
**166 South St., NEW YORK CITY.**  
**267 Front St.,****DESPARD BROTHERS,**  
**60 Wall St., New York. P. O. Box 764.**Importers of  
New and Old Rails, Steel Blooms,  
**SCRAP IRON, &c.**

Duty paid or in bond.

**B. F. JUDSON,**  
Importer of and Dealer in  
**SCOTCH AND AMERICAN****Pig Iron,**Wrought & Cast Scrap Iron,  
**OLD METALS.**457 & 459 Water St., NEW YORK.  
933 & 235 South St.,**Manhattan Rolling Mill.****J. LEONARD,**  
**445 to 451 West St., 177 & 179 Bank St.,**  
**NEW YORK,**Manufacturer of  
**HORSE SHOE IRON,**  
Toe Calk Steel,  
Rods, Ovals, Half Ovals and Flats.**DANIEL F. COONEY,**  
(Late of and successor to Jas. H. Holdane & Co.)  
88 Washington St., N. Y.**BOILER PLATES & SHEET IRON,**  
**LAP-WELDED BOILER FLUES,**  
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.Agency for Glasgow Iron Co., Jos. L. Bailey & Co.,  
Pine Iron Works, Lebanon Rolling Mills, Chester  
Pipe and Tube Co., Albany & Sons Iron & Steel Co.'s  
celebrated Boiler Rivets; Homogeneous Steel, Boiler  
and Fire Box Plates.**HUGH W. ADAMS & CO.,**  
IMPORTERS OF  
**SCOTCH AND ENGLISH IRONS,**Agents for American Charcoal and Anthracite Furnaces,  
**56 Pine Street, New York.**

HUGH W. ADAMS. DANIEL L. COBB.

IRON.

PITTSBURGH.

**W. D. WOOD & CO.'S****PATENT****Planished Sheet Iron.**Patented March 14th, 1865; April 8th, 1873;  
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.Guaranteed fully equal in all respects to the  
**IMPORTED RUSSIA IRON,**  
and at a much less price.**FOR SALE,**  
by all the principal**METAL DEALERS**  
In the Large cities throughout**THE UNITED STATES.**  
And at their Office,

111 Water Street, PITTSBURGH, PA.

**C. KANE,**  
**OLD RAILS, SCRAP IRON, STEEL,****PIC IRON, BLOOMS,**  
**AND ORE.**  
**PITTSBURGH, PA.**WM. REA, Presd. SAM'L BAILEY, Jr., Secy.  
F. B. LAUGHLIN, Vice-Presd. W. A. SHAW, Treas.**UNION STORAGE CO.**RECEIVE ON  
**Storage and Issue Warrants**  
ON**PIC IRON, BLOOMS, INGOTS,**  
**MUCK BAR, RAILS, &c.**Correspondence relative to establishment of  
yards at furnaces solicited.

General Office, PITTSBURGH, PA.

IRON.

PITTSBURGH.

**STEEL TOE CALKS.**

Extra Quality Homogeneous Steel

**BOILER PLATE**

STEEL PLATES, all descriptions.

Cut Nails and Spikes, Plate and Sheet  
Iron, all descriptions.**SHOENBERGER & CO.,** Pittsburgh, Pa.**KEYSTONE ROLLING MILL, Limited,**  
Manufacturers of**IRON,**  
Pittsburgh, - - - Pa.**Bonnell, Botsford & Co.,****Iron, Nails & Spikes.****YOUNGSTOWN, OHIO.****MARSHALL IRON CO.,**  
Manufacturers ofBest Charcoal Bloom, Best Refined & Common  
**SHEET IRON.**

Office and Mills, Newport, Delaware.

**Sable Iron and Nail Works.****ZUC & CO.,**

Manufacturers of the Celebrated

**Sable Nails**

Office and Works,

**PITTSBURGH, PA.****LEECHBURG IRON WORKS.****KIRKPATRICK & CO.,**Manufacturers of all grades of  
**FINE SHEET IRONS,**  
(Refined Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel, Ferrule Iron, &c.)  
**NATURAL GAS USED AS FUEL.**

OFFICE, No. 143 First Ave., Pittsburgh, Pa. WORKS, Leechburg, Pa.

**CORRUGATED AND CRIMPED IRON**  
**ROOFING & SIDING,**  
Iron Buildings, Roofs,  
Shutters, Doors, Cornices,  
Skylights, Bridges, &c.**MOSELEY IRON BRIDGE AND ROOF CO.,**  
**5 Day Street, New York.**Joseph P. Reed. R. Hope Hepburn.  
**JOSEPH P. REED & CO.,**  
Iron Brokers and Commission Merchants,  
263 S. Fourth St., Philadelphia.Sole Agents for  
**RIDGEVIEW COAL AND COKE CO., Latrobe.**  
**J. D. BOYLE'S CONNELLSVILLE COKE.**  
**HARRISON & WALKER'S FIRE BRICKS.**

MAGNETIC and HEMATITE IRON ORES a Specialty.

**N. M. HÖGLUND'S SONS & CO., Stockholm.****Swedish & Norway Iron**of every description. Stock on hand at Boston,  
New York and Philadelphia. Importation orders a  
specialty.**GUSTAF LUNDBERG,** 38 Kilby st., Boston  
**ALBERT POTTS,** Philadelphia Agent, 234 & 236 N.  
Front street.**CHARLES HUBBARD,**  
**"Sheridan" & "Leesport**Brands Pig Iron,  
**WHITE IRON (Anthracite & Bessemer)**  
Stock for making strong castings.**"CHARCOAL PIG IRON,"**  
"Maiden Creek" and "Garrick" brands.Favorite brands of Scotch Pig Iron,  
In stock and to arrive.**OLD CAR WHEELS, BEST BRANDS,**  
**46 Cliff St., New York City.**



**Iron.**  
PHILADELPHIA.  
**Siemens' Regenerative  
GAS FURNACE.**  
**RICHMOND & POTTS,**  
119 N. Fourth St., PHILADELPHIA, PA.

**Iron.**  
PHILADELPHIA.  
**HENRY LEVIS & CO.,**  
**Manufacturers' Agents**  
For Iron and Steel Rails, Car Wheels, Boiler and  
Sheet Iron and General Railway  
Equipments.  
Old Rails, Axles, and Wheels bought and sold.  
234 S. 4th St., Philadelphia.

**The Cambria Iron and Steel Works,**  
Having enjoyed for over TWENTY-FIVE YEARS the reputation of producing the best quality of  
**RAILS,**  
have now an annual capacity of  
150,000 Tons of Iron and Steel Rails, Splice Bars, &c.  
ADDRESS,  
**CAMBRIA IRON COMPANY,**  
No. 218 South 4th Street, Philadelphia.  
Or at the Works, JOHNSTOWN, PA.  
Or LENOX SMITH, New York Selling Agent, 46 Pine St., N. Y.

**THE PHOENIX IRON CO.,**  
410 Walnut Street, PHILADELPHIA.  
Manufacturers of Wrought Iron  
**Beams, Deck Beams, Channels, Angle & Tee Bars,**  
**STRAIGHT AND CURVED TO TEMPLATE,**  
Largely used in the construction of Iron Vessels, Buildings and Bridges.  
**WROUGHT IRON ROOF TRUSSES, CIRDERS & JOISTS,**  
and all kinds of Iron Framing used in the construction of Fire Proof Buildings.  
**PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,**  
and built up shapes for Iron Bridges.  
**REFINED BAR, SHAFING, and every variety of SHAPE IRON made to order.**  
Plans and Specifications furnished. Address **DAVID REEVES, President.**  
NEW YORK AGENTS, MILLIKEN & SMITH, 95 Liberty Street.  
BOSTON AGENTS, FRED. A. HOUDLETTE & CO., 19 Battery-march St.

**ALAN WOOD & CO.,**  
MANUFACTURERS OF  
Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom  
**PLATE & SHEET IRON.**  
No. 519 Arch St., Philadelphia, Pa.  
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,  
Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

**NAILS**  
**JAS. ROWLAND & CO.,**  
Kensington Iron, Steel & Nail Works,  
990 North Delaware Ave., - PHILADELPHIA,  
Manufacturers of the  
Anvil Brand Refined Merchant Bar Iron.  
Also, the James Rowland & Co. Kensington ★ Nails, cut from  
their Refined Anvil stock. Also, Plow and Cultivator Steel, Rounds,  
Squares, Flats, Bands and Hoop Iron.  
Correspondence with Dealers solicited.

**PENCOYD IRON WORKS.**  
**A. & P. ROBERTS & CO.,**  
Manufacturers of  
**CAR AXLES.**  
**BAR, ANGLE, TEE AND CHANNEL IRON.**  
Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

**QUAKER CITY FACING MILLS,**  
Pier 45 North Delaware Avenue,  
PHILADELPHIA, PA.

Please send for Special Price List of our celebrated Machinery Facings.  
**Mineral Facing, X Facing, Stove Plate Facing,**  
**IXL Facing, XX Facing, Lead Facing,**  
**Charcoal Facing, Anthracite Facing, Bituminous Facing,**  
**Soapstone Facing, Lehigh Facing, Sea Coal Facing.**  
**MANUFACTURERS OF FOUNDRY SUPPLIES.**  
Riddles, Shovels, Steel Wire Brushes, Bellows, Screens, Buckets, Bristle Brushes, Mallets, Sand  
Sifters, Steel Wheelbarrows, Rammers.  
Our increased capacity insures prompt shipment of orders by telegram.

**J. W. PAXSON & CO.,**  
DEALERS IN  
**MOULDING SAND.**

**ALLENTOWN ROLLING MILL COMPANY,**  
Manufacturers of  
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,  
Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.  
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.

JAMES C. BOOTH. THOMAS H. GARRETT. ANDREW A. BLAIR.  
**BOOTH, GARRETT & BLAIR,**  
**Analytical and Consulting Chemists,**  
919 and 921 Chant St. (10th St. above Chestnut St.), PHILADELPHIA, PA.  
Established in 1836.

Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the  
**ANALYSIS OF IRON AND STEEL,**  
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron Steel, Iron  
Ores, Slags, Limestones, Coals, Clays, Fire Sands &c. Agents for sampling ores in New York and  
Baltimore. Price lists on application.

**Iron.**  
**Edward J. Etting,**  
IRON BROKER AND COMMISSION MERCHANT,  
230 S. Third St., Philadelphia, Pa.  
**Pig, Bar and Railroad Iron.**  
OLD RAILS, SCRAP, &c.  
Agent for the

**MOUNT SAVAGE FIRE BRICK,**  
The Allentown Iron Co. and  
The Coleraine Furnaces.  
STORAGE WHARF AND YARD  
DELAWARE AVENUE ABOVE CALLOWHILL STREET,  
connected by track with railroad.  
Cash advances made on iron.

**J. Wesley Pullman,**  
407 Walnut St., Philadelphia,  
Exclusive SALES AGENT  
**Chester Iron Co.'s Blue, Red and Hot  
ORES.**  
Also celebrated "Brotherton" Ore.

T. HORACE BROWN. D. W. R. READ.  
**D. W. R. READ & CO.,**  
Importers and dealers in

**FOREIGN & NATIVE  
BESSEMER ORES.**  
**PIG IRON ENGLISH FIRE BRICK.**  
205½ Walnut St., PHILADELPHIA.

142 Pearl St., 57 Gracechurch St., 67 S. Gay St.,  
NEW YORK, LONDON, BALTIMORE.

**J. O. RICHARDSON,**  
IRON COMMISSION MERCHANT,  
No. 232 Dock St., Philadelphia,  
**Pig Iron, Railroad Iron and  
Iron Ores.**  
Sole Agent for the MONOCACY FURNACE CO.

DEALER IN  
**MOSELEM, ROCKHILL, WARWICK,**  
And other Favorite Brands.  
**SILVER GREY IRON A SPECIALTY.**

**J. W. HOFFMAN & CO.,**  
Iron Merchants & Railway Equipments.  
208 South Fourth St., Philadelphia.

Sole agents Glasgow Iron Co. and Pine Iron Works  
manufacturers of Muck Bar and all grades of Plate  
Iron. Celebrated "Glasgow" and "Pine"  
brands for fire boxes and difficult flanging. Pig and  
Bar Iron, Rails and all shapes in iron. Quotations  
given on Bridge and Building Specifications.

**WROUGHT IRON**

**Boiler Tubes,**  
Steam, Gas and Water Pipe.  
Oil Well Tubing, Casing and  
**LINE PIPE.**

Cotton Presses, Forgings,  
**ROLLING MILL AND  
General Machinery.**

**READING IRON WORKS,**  
261 S. Fourth St., Philadelphia.

G. A. HERBERTON. S. FRANK SHARPLESS.  
**HEBERTON & CO.,**  
Selling Agents and Commission Merchants  
For the sale of  
**Pig, Bloom, Plate, Bar, Scrap, Galvanized,  
Black, Sheet, Pipe and Railroad  
IRON.**  
No. 333 Walnut St., Phila.  
Charcoal Bloom and Pig a specialty.

**IRON. STEEL.**  
**SCRAP OF ALL KINDS A SPECIALTY.**  
First Quality Muck Bars.

**SHIMER & CO.,**  
Late of and successors to W. HUTTON & CO.,  
250 S. Third St., Philadelphia.

**J. J. MOHR,**  
Iron Commission  
Merchant,  
No. 430 Walnut Street, Philadelphia.

Sole Agent for the Sheridan and Leasport Furnaces.  
Established 1837.  
**A. PURVES & SON,**  
Dealers in

**Scrap Iron, Metals and Machinery,**  
Cor. South and Penn Sts., Philadelphia.  
Offer for sale in large or small lots, quantities to  
suit. Old Machinery, Red Scrap Brass (selected), Old  
heavy Yellow Scrap Brass, Ingot Red Brass (best qual-  
ity), Ingot Yellow Brass, Ingot Gun Metal made  
strictly from old cannon.

**FRANCIS WISTER,**  
Sole Eastern Agent for  
**A. A. HUTCHINSON & BRO.**  
**CONNELLSVILLE COKE.**  
ORES, Native and Foreign.  
230 South Third Street, Philadelphia.

**J. F. BAILEY & CO.,**  
216 South 4th St., Philadelphia. 52 Wall St., (Room 8) New York.

Selling Agents  
**ATKINS BROS.—BEAMS, CHANNELS, RAILS, &c.**  
**A. & P. Roberts & Co.—Car Axles, Plates, Channels, Tee,  
Angle and Bar Iron.**

**WILLIAM McILVAIN & SONS—Boiler, Ship and Bridge Plates.**  
**BERWICK R. M. BARS AND SHAPE IRON.**  
Advances on Consignments of Old Material and sales promptly made.

**CHAINS.**  
**BRADLEE & CO.,** 816 Richmond Street,  
Philadelphia.  
Manufacturers of  
Steel Chain and the Celebrated "D. B. G."  
Special Crane Chain.  
All Chains carefully tested and examined and certificate of proof  
furnished. Dredging, Mining and Crane Chains, Rattler Chains,  
Toggles, Eye Bolts and Log Dogs.

**Iron.**  
**JUSTICE COX, Jr.** CHARLES K. BARNES.  
**JUSTICE COX, JR. & CO.,**  
AGENTS FOR  
CHICKIES, ST. CHARLES, MONTGOMERY  
WARWICK, CONEWAGO AND KEYSTONE  
**Foundry & Forge Pig Iron.**  
SHAWNEE ROLLING MILL CO., Limited,  
Best Quality Muck Bar.  
**CATASAUQUA MFG. CO.'S**  
**Bar, Angle, Skelp and Sheet Iron.**  
Railroad Car Axles. New and Old Rails.  
No. 333 Walnut St., Philadelphia.

**PETER WRIGHT & SONS,**  
307 Walnut Street, Philadelphia,  
19 Broadway, New York,  
44 Second Street, Baltimore,  
Importers of  
German and English

**SPIEGELEISEN,**  
Pig, Scrap,  
**NEW AND OLD RAILS,  
And Iron Ore.**

**Italian and Spanish  
CHARCOAL IRON,**  
CHILL-GRADED,  
**For Car Wheels, &c.**

FOR SALE BY  
**ALFRED EARNSHAW,**  
203 Walnut Place, PHILADELPHIA.

**BLAKEY & WALBAUM,**  
206 S. Fourth St., PHILADELPHIA.  
SPECIALTIES:  
**NEW AND OLD RAILS,  
BLOOMS, BESSEMER PIG,  
Spiegeleisen Iron Ores  
AND  
Railroad Supplies Generally.**

**THE  
STANDARD  
STEEL  
WORKS.**

**LOCOMOTIVE AND CAR WHEEL TIRES.**  
Manufactured from the celebrated OTIS STEEL.  
BRAND  
**STANDARD.**  
Quality and efficiency fully guaranteed. Prices as  
low as any of the same quality. We manufacture  
Heavy and Light Forgings, Driving and Car Axles,  
Cranks, Pins, Piston Rods, &c.  
Works at Lewistown, Pa.  
Office, 220 S. 4th St., Philadelphia, Pa.

**LANGHORNE WISTER. RODMAN WISTER.**  
**L. & R. WISTER,**  
**IRON BROKERS.**  
Agents for the Clearfield Fire Brick Co.'s  
Fire Bricks.  
No. 230 South 4th St., Philadelphia.

**PATENT  
SOLID STEEL  
CALK  
HORSE & MULE  
SHOE.**

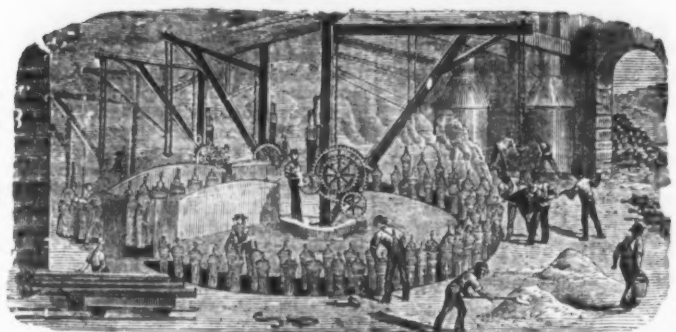
**KEYSTONE HORSE SHOE CO.,**  
17th and Clearfield Sts., Philadelphia, Pa.  
Manufacturers of the Keystone Patent Solid  
Steel Calk Horse and Mule Shoes.  
These Shoes are made of superior iron and steel,  
completely finished and ready for cold shoeing;  
have clip and solid steel calk. The holes are  
punched through at the proper angles and free  
from burrs. Same number of Shoes per keg as in  
kegs of unfinished shoes.

while London stood £93, and Singapore \$28.25. It was shown that the world's supply in 1880 had been 40,000 tons, against 38,000 in 1879; 36,000 in 1878, and 34,000 in 1877, while in 1873 it had only been 26,000, an increase of 50% in seven years; if, therefore, consumption had not so materially increased in this country, it would have been difficult to cope with this rapidly expanded production, and the price might have gone unprecedently low for a time. Fortunately for producers, considerably reduced as consumption has been among us in 1881, it has still been large enough to prevent much of a decline till later on speculation took charge of the metal. In January some conflicting interests here and in Europe kept prices fluctuating—at New York between 19¢ and 20½¢, and in London between £90 and £93. 10/. The import of Tin into the United States in 1880 was 13,346 tons, worth \$6,120,316, against 10,186 tons, worth \$3,605,614 in 1879. From the Straits alone there were shipped to the United States in 1880, 8650 tons, against 7300 in 1879; 4140 in 1878, and 4204 in 1877, having more than doubled since 1878. On March 1 the visible supply here was found to be reduced to 3700 tons, in consequence of light shipments from the Straits this way in February, which kept our market steady during the latter month within the range of 20¢ @ 20½¢, while in England and Holland, on the contrary, statistics had grown to become more and more unfavorable, having increased 1624 tons in a single month, due to large shipments thither from the Straits and Australia. London, under these circumstances, receded in February to £88. In March the position of Tin on this coast improved still more, deliveries to consumption during the month aggregating 1000 tons, the visible supply at its close being 300 tons less than the previous one, while the price varied little from 20¢. The spring campaign now drawing near, a better feeling began to prevail, without, however, attracting any speculative demand, the outlook in Europe still being doubtful and the price of Straits remaining £88. During the month of April consumption remained as steady as during the preceding one, 1000 tons again being taken at firm prices, the metal being looked upon even more favorably, Straits being worth 20½¢ and the visible supply toward the close not exceeding 1400 tons. In England and Holland statistics had at length improved a little, the visible supply being on May 1, 14,299 tons against 14,780 on April 1. While Tin was thus well calculated to inspire more confidence both here and in Europe, the spring trade proved a sore disappointment on both sides of the ocean, causing a feeling of great apathy in May and a decline from 20½¢ to 19¾¢ at New York, and to £86. 10/ in London. The declining tendency on this side was even precipitated by resales effected by discouraged holders for a rise. June thus opened with Tin in a very dull mood. The depression thus caused upon markets statistically in reality improved it, and provoked a concerted speculative movement for a rise on both sides in the course of the month, which carried the price again to 20½¢ here, and to £89. 10/ in London, the amount delivered to consumption here reaching 700 tons in June against 800 in May, while the visible supply on July 1 had swelled again at this center to 3480 tons. July did not, however, develop much activity on either side; the price here remained steady at 20½¢, and £90 in London. Neither side seemed to be prepared to respond to a speculative movement unsupported by an active consumptive demand. The visible supply stood on August 1, 3770 tons, the deliveries in July having been only 650 tons. As at this time it was shown that during the first six months of the year there had been shipped to the United States only 2049 tons of Tin, against 4200 during the corresponding period of 1880, the metal at ruling figures was looked upon as tolerably safe, notwithstanding the decrease in consumption. The price consequently recovered among us in August to 21¼¢, and in London to £92; the deliveries to consumption became a little larger, being 880 tons here and 2020 in Europe, while the shipments to Europe and America during the month amounted in the aggregate to 2150 tons only. September, while again showing fair deliveries on this side of 900 tons, leaving us with a visible supply at its close of 3900 tons, remained unexcited, but advancing to 21¾¢. In Europe, on the contrary, the speculative and upward movement made further progress, pushing the price of Straits to £96. Shipments from the Straits settlements to the United States during the first eight months had been 3206 tons against 5952 in 1880; 3810 in 1879; 2475 in 1878; 2080 in 1877, and 1513 in 1876, showing, after all, a moderate supply thence so far in 1881. Consumption took in October only 700 tons here, and, as the shipments had meanwhile become larger this way from the Straits, Australia and Java, say 2600 tons aloft on November 1, the visible supply reached 5000 tons. The speculators for a rise operating at London and New York, simultaneously or alternately as circumstances commanded, at this time clearly perceived that it would be imperative to first get control, if possible, of the market here and at Boston, and thus improve the statistical position here, if need be, by shipping a considerable amount of Tin from here to Europe. The ugly feature of a large visible supply would then disappear, the more so as they determined to run up prices in the Straits to such a point as to put a stop to shipments this way altogether. While this was preparing here, they began to run up the price in London and Holland. This was facilitated by some large purchases that had been made in the latter country by solid capitalists, who, thinking well of the metal, resolved to hold it out of the market for some time. Although in one respect the period chosen was unfavorable, inasmuch as it coincided with the heaviest Tin shipment of the year from Australia during the wool season, the speculation proved a complete success so far as obtaining control of the market and running up the price was concerned, a success all the more astonishing as from a statistical point of view there was nothing to warrant the movement, actual consumption being no greater between Europe and America than before, while production had abated nowhere. While in November Straits Tin advanced at New York from 20¾¢ to 22¢, London rose from £97. 10/ to £107. 10/ after some fluctuations. Consumption here had



## A. H. McNEAL, BURLINGTON, N. J.

Flange Pipes.



General Foundry Work.

### CAST IRON PIPES FOR WATER AND GAS.

ESTABLISHED IN 1848.

## SINGER, NIMICK & CO., Limited, PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

### STEEL,

Warranted Equal to any Produced.

#### BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

#### SAW PLATES

For Circular, Muley, Mill, Gang, Drag, Pit and Cross-Cut Saws.

#### Sheet Steel

For Springs, Bullet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

#### SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Rollers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface finish and exactness of gauge.

#### ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Flow Steel.

"Iron Center" Cast Flow Steel. Finished Rolling Flow Counters with Patent Screw Hubs attached.  
"Soft Steel Center" Cast Flow Steel. Agricultural Steel cut to any pattern desired.  
"Solid Soft Center" Cast Flow Steel. Steel Forgings made to order.

Represented at 59 Beekman St., New York, and 417 Commerce St., Philadelphia, by HOGAN & BURROWS, Gen'l Agents for Eastern and New England States.

### THE MIDVALE STEEL COMPANY, CRUCIBLE AND OPEN-HEARTH STEEL.

### TIRES and AXLES OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel  
Castings and Forgings.

Works and Office,

Nicetown, Philadelphia, Pa.

Warehouse,

12 N. 5th St., Philadelphia, Pa.

## STEEL FORGINGS

Of all Descriptions.

Address orders to

THE PHILADELPHIA STEEL FORGE, Office, Frankford, Philadelphia, Pa.

GENERAL WESTERN AGENTS,

CHAS. I. WICKERSHAM, & CO., No. 154 Lake Street, Chicago.

ESTABLISHED 1847.

### A. WHITNEY & SONS, PHILADELPHIA,

### CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Tramways. Wheels furnished in rough bored or on axles. Chilled castings made to order.

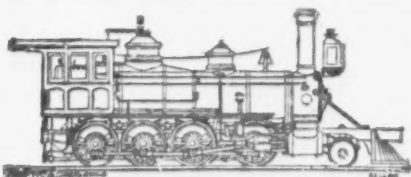
### PENNSYLVANIA STEEL COMPANY, Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

Address all orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



#### BALDWIN LOCOMOTIVE WORKS,

BURNHAM, PARRY, WILLIAMS & CO., Proprietors,  
Philadelphia, Pa., U. S. A.

Manufacturers of

#### LOCOMOTIVE ENGINES of every Description.

Catalogues, photographs and estimates furnished on application of customers.

#### NOISELESS STEAM MOTORS, For city and suburban Railways.



These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse-cars and draw additional cars. Circulars with full particulars supplied.

## ROANE IRON COMPANY,

Manufacturers of and Dealers in

### Pig and Railroad Iron.

CHATTANOOGA, - - - - - TENN.

### L. HERNSHEIM,

### Importer and Commission Merchant,

105 John Street, NEW YORK.

NEW AND OLD STEEL AND IRON RAILS, STEEL RAIL BLOOMS,  
Bessemer and Spiegel Iron, Ferromanganese.

Sole Agent for the United States for the

### STEEL AND IRON WIRE RODS AND FOR THE

### HUTTENBERG (AUSTRIA) IRON WORKS, CHARCOAL PIG IRON FOR CHILLED CAR WHEELS,

For the Siemens-Martin and Crucible Steel Manufacture.

EXTRA SOFT CHARCOAL STEEL BLOOMS, BILLETS AND RODS FOR COLD RIVETS, &c.  
Superior Drill, Scythe, Tool and Die Steel Manufactured from Charcoal Iron,  
&c., &c.

### BRITTON IRON AND STEEL CO.,

MANUFACTURERS OF

### IRON AND STEEL BOILER PLATE,

Tank, Bridge and Ship Plates,

BLACK AND GALVANIZED SHEET IRON.

Works foot of Wason St., cor. L. S. & M. S. R. R. CLEVELAND, O.

### JACKSON IRON COMPANY,

Manufacturers of

Fayette Pig Iron (L. S. Charcoal), Especially adapted for Bessemer, Siemens-Martin, and Crucible Steel. Also, Hammered Blooms, Billets and Muck Bar, extra low in phosphorus, for Siemens-Martin and Crucible Steel. Miners of Jackson (Lake Superior) Iron Ores. FAYETTE BROWN, Gen'l Agent. HARVEY H. BROWN, Asst. Gen'l Agent. Offices, 130 Water St.

### HARVEY H. BROWN & CO.,

AGENTS

### CHAMPION IRON CO., LAKE SUPERIOR IRON CO. } Lake Superior Iron Ores.

Dealers in Pig Iron, Iron Ores and Old Rails.

Offices, 130 Water Street, - - - CLEVELAND, OHIO.

### ORFORD NICKEL AND COPPER COMPANY, SMELTERS AND REFINERS OF COPPER.

THOS. J. POPE & BRO., Agents, 292 Pearl St., New York.

Copper Ore, Mattes or Bullion purchased. Advances made on consignments for refining and sale. Smelting and Refining Works at Bergen Point, near New York. Offices, 292 Pearl St., New York.

### CHARLES HUBBARD, 46 Cliff St., New York City HEAVY STEEL AND IRON FORGINGS,

For Marine and Stationary Engines.

Homogeneous Steel Boiler Plate, "Nashua" Brand. Best YORKSHIRE BAR, "TAYLOR" IRON, for Stamped Work, Screws, etc., etc. MUSHET SPECIAL TOOL STEEL, requires neither tempering nor hardening. Estimates given.

### Kelly Steel Barb Wire.



Patented in 1868 and fully licensed under all the bottom patents. Its WEIGHT IS ONE POUND TO THE ROD, and is a Fence for a lifetime.

Is adopted by railroads, by stock raisers and by farmers generally, on account of its superior style of barb, giving STRENGTH and LIGHTNESS, and always holds its sharp point. In the

#### BARB WIRE LAW SUITS

a decision has been rendered sustaining all the Patents, and all manufacturers, dealers and users infringing will be held liable for damages.

We do not sell to jobbers, but want one reliable retail dealer in each town.

THORN WIRE HEDGE CO., 15 to 21 N. Clinton St., Chicago.

### IRON AND STEEL DROP FORGINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders', and Plasterers' Tools, Saddlers' Round and Head Knives.

### WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

### HOOPES & MERRY,

Manufacturers of

"LION" Brand or B. B.—"PHENIX" Brand or Best Charcoal

### GALVANIZED SHEET IRON,

539, 541, 543, 545 and 547 West Fifteenth Street, New York. C-rugated Sheet Iron. Black or Galvanized. All kinds of ironwork, Tinned or Galvanized.

### BIRMINGHAM ROLLING MILL CO.,

MANUFACTURERS OF

### BAR, BAND AND HOOP IRON, T-RAILS AND SPLICE BARS.

Also, Street and Tram Rails.

Birmingham, Alabama.

Head Office, Louisville, Ky.

We solicit inquiries for Bar Iron and small Rails. Orders filled promptly.

C. W. LEAVITT, 137 Broadway, Room A, 2d Floor, New York.

NEW AND OLD

### RAILS AND RAILWAY EQUIPMENT.

General Agent ALLENTOWN ROLLING MILLS, Agent for PARDEE CAR & MACHINE WORKS.

### THE COMBINATION

IRON CLAD STEEL HORSE SHOE CO., SELF WELDING STEEL TIRE CO., BILLET AND WIRE CO.

Sole and exclusive manufacturers of "Wheeler's Combination" Shoes, Shoe Bars and Toe Calks. Tire and Wire. Full particulars upon application by mail or otherwise to WARE H. GAY, Treasurer, 66 State Street, Boston, Mass. All persons cautioned against infringements.

## CHAS. G. LUNDELL,

No. 7 Exchange Place,

BOSTON,

Mass.

REPRESENTING

Ekman & Co.

GOTHENBURG,

SWEDEN.

## E. W. CLARK & Co.

Bankers and Stock Exchange Brokers,

No. 35 South Third St., Philadelphia.

## CLARK, POST & MARTIN,

No. 34 Pine St., New York,

Bankers and Railway Commission Merchants, Importers of

Pig Iron, New and Old Rails, Scrap Iron, &c.

## W. S. MIDDLETON, Broker in Machinery & Iron

Agent for

FORSTER'S CRUSHER & PULVERIZER, The best in market.

W. S. MIDDLETON, 52 John St., N. Y.

## S. CHENEY & SON

Manlius, N. Y.,

## Small Gray Iron Castings.

We warrant our work for smoothness and finish.

## NORTH BROS.,

23d and Race Sts., Philadelphia.

Fine Light and Medium-Weight GRAY IRON CASTINGS to order.

Correspondence solicited.

## JNO. J. SHIPHERD, INVESTMENT BANKER,

And Dealer in

Lake Superior Iron Mining Stocks, CLEVELAND, OHIO.

Correspondence solicited.

## MOSES GOLDSMITH & SON

Key Box 156,

CHARLESTON, S. C.

Wholesale dealers in

## METALS, IRON RAGS,

And all kinds of Pa y Stock.

We invite correspondence.



## P. W. Gallaudet



Cor. Broadway and Wall St., New York. Bankers and dealers in COMMERCIAL PAPER. Stocks and Bonds dealt in for cash or on margin at New York Stock Exchange.

## WM. McFARLAND, Iron and Brass Founder,

TRENTON, N. J.

Chilled Cast Wire Dies a Specialty. Any size or style made at short notice.

## MACHINERY FOR Straightening and Cutting Wire

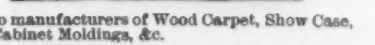
Of all Sizes to any Length. Send for Catalogue.

## JOHN ADT,

New Haven, Conn., U. S. A.

## CHAMPION WEATHER STRIPS.

The Best in the Market. For Sale by all Hardware Dealers.



Also manufacturers of Wood Carpet, Show Case, and Cabinet Mouldings, &c.

## DENNIS & CO.,

167 Madison St., CHICAGO, ILL.

Factory, 317 and 319 W. Lake St.

## TELESCOPE TUBES.

Fine Mandrel-drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEAKIN & CO., 500 N. 12th St., Philadelphia, makers of the American Improved Brass Garden Syringes.









**AUBURN FILE WORKS,**  
Superior Hand-Cut  
**FILES AND RASPS,**  
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.  
**FULLER BROS., Sole Agents,**  
89 Chambers and 71 Reade Streets, N. Y.

Paris, 1878. **McCAFFREY & BRO.,** For Superiority.  
PENNSYLVANIA FILE WORKS,  
Philadelphia, Pa., U. S.

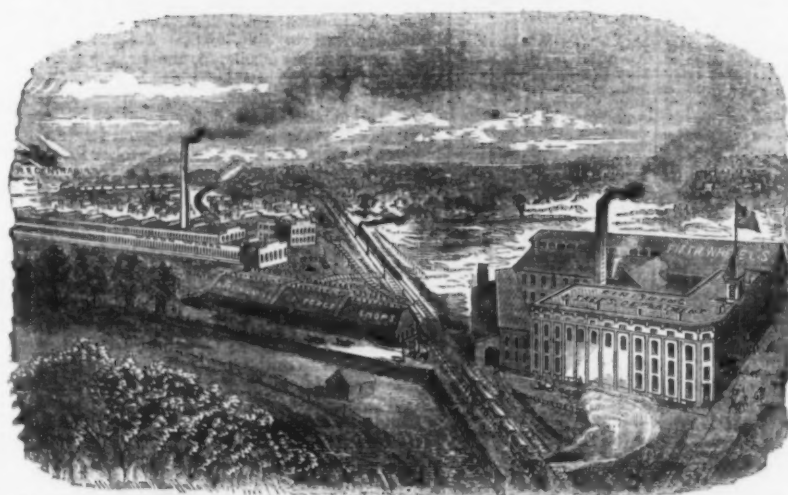


Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

**GRAHAM & HAINES,**

P. O. Box 1042. 113 Chambers and 95 Reade Streets, New York.  
**HARDWARE MANUFACTURERS' AGENTS, as follows:**  
**Detroit Block Works,** Tackle Blocks.  
**Howard Bros. & Co.,** Cotton, Wool and Curry Cards.  
**Thompson, Derby & Co.,** Scythe Snaths.  
**Otago Fork Mills,** Steel Forks, Rakes, Hoes, &c.  
**H. Knickerbocker,** Scythes, Axes and Tools.  
**H. W. Kipp,** Nail Hammers.  
**Iron City Tool Works Ltd.,** Picks, Mattocks, Grub Hoes, &c.  
**Jacobus & Nimick Mfg. Co.,** Locks, &c.  
**Sandusky Tool Co.,** Planes and Plane Irons.  
**Geo. M. Eddy & Co.,** Measuring Tapes.  
**Wheeling Hinge Co.,** Hinges and Wrought Butts.  
**Northwestern Horse Nail Co.,** Horse Nails.  
**A. G. Coes & Co.,** Coes' Genuine Screw Wrenches.  
**F. K. Silby,** Emery Cloth.  
**Sedgwick Mfg. Co.,** Butter and Flour Triers, etc.  
**Ripley Mfg. Co.,** Mouse Traps.  
**Sam'l Loring,** Plymouth Tack & Rivet Works.  
**Carr, Crawley & Devlin,** Miscellaneous Hardware & Cast Butts.  
**J. Mallinson,** Cast Steel Shears and Scissors.  
**Ketchum's Pat. Metallic Sieves.**  
**W. D. Turner & Co.,** Geneva Hand Fluters.  
**American Screw Co.,** Gimlet Pointed Screws, &c.  
**Romer & Co.,** Brass Locks, &c.  
**P. Lowenbraut,** Compasses, Callipers, Dividers, &c.  
**Clark Bros. & Co.,** Carriage Bolts, &c.  
**Louwer & Tucker,** the Genuine Knox Fluting Machine.  
**T. B. Barclay,** "Dodge's" Kentucky Cow Bells.  
**Lane Bros.,** Swift's and Grocers' Coffee Mills and Measuring Faucets, &c.  
**T. C. Richards Hardware Co.,** Bright Wire Goods, Picture Nails, &c.

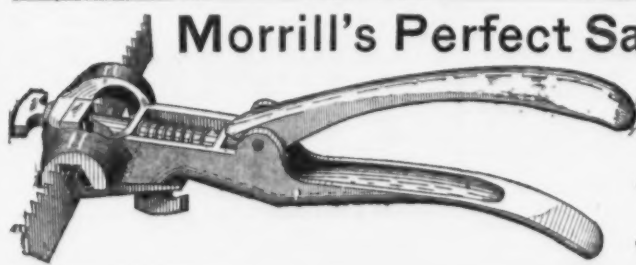
**CARRIAGE HARDWARE.**



Our new Illustrated Catalogue of 140 pages, and over 300 illustrations, will be mailed on application.

**THE E. D. CLAPP MFG. CO., Auburn, N. Y.**

**Morrill's Perfect Saw Sets.**



For price lists and discounts, address  
**ASA FARR,**  
64 College Place,  
corner of  
Chambers Street,  
New York.

**SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.**

**THE WHITE MOUNTAIN FREEZER COMPANY** are headquarters for Ice Cream Freezers and Ice Crushers, being the only firm in the United States who manufacture all parts of the raw material. The **medal the Sands' Triple Motion** Freezer to all persons in the world for the following reasons: We have used them; they freeze quicker than any other; they save time, salt and ice; the triple motion makes smooth cream without lumps; makes more of it; galvanized iron outside; tin inside; no zinc in contact with the cream; easily adjusted; substantially made; simple in construction; perfect in results. Send for descriptive circular and discount of this celebrated Freezer. Address,

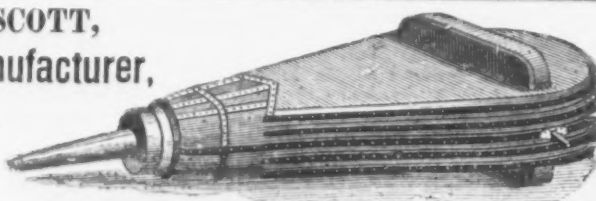


**HAND FREEZER.** 2 to 25 qts. \$3.50 to \$25.00.  
**HAND OR POWER.** 25 and 50 qts. \$75.00 and \$125.00.  
**HAND OR POWER ICE CRUSHER.** \$75.00.

**White Mountain Freezer Co.,**  
Nashua, N. H., U. S. A.

**SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.**

**GEO. M. SCOTT,**  
**Bellows Manufacturer,**  
Johnson Street,  
Cor. 22d St.,  
**CHICAGO, ILL.**



**TACKS, NAILS & RIVETS.**

Sweden Iron Upholsterers' Gimp, Lace and Card Tacks. Black and Tinned Trunk and Clout Nails. Finishing Nails and Brads; Shoe Nails of Swedes and Common Iron; Copper, Brass & Steel. Lining & Saddle Nails; Tufting Nails & Tufting Buttons; Brass and Iron Wire Nails; Molding Nails; Escutcheon Pins; Black and Galvanized Regular and Chisel Pointed Boat Nails.

**New York Salesroom, 116 Chambers Street.**

**AMERICAN TACK CO., Fairhaven, Mass.**

**Nicholson**  
**FILES.**

Bandsaw Files,  
Boot Heel,  
Brass,  
Cabinet,  
Cant,  
Cotter Taper,  
Cotter Equaling,  
Cross or Crossing,  
Doctor,  
Drill,  
Feather Edge,  
Finishing,  
Flat  
Flat Equaling,  
Flat Wood,  
Gang-Edger,  
Ginsaw,  
Gulleting,  
Half-Round,  
Half-Round Wood,  
Hand,  
Hand Equaling,  
Handsaw Blunt,  
Handsaw (Double-End),  
Handsaw Taper, single cut,  
Handsaw Taper, double cut,  
Handsaw Taper, slim,  
High Back,  
Hook-Tooth,  
Knife,  
Knife Blunt,  
Lead Float,  
Lightning,  
Machine Mill,  
Mill,  
Mill Blunt,  
Mill Pointing,  
Pillar,  
Pitsaw,  
Reaper,  
Roller,  
Round,  
Round Blunt,  
Slotting,  
Slim Handsaw Taper,  
Square,  
Square Blunt,  
Square Equaling Files,  
Stave Saw,  
Three-Square Files,  
Three-Square Blunt Files,  
Tumbler Files,  
Union Cut,  
Warding Files,  
Warding Blunt File,  
Warding Round Edge File.

**RASPS.**

Baker's,  
Beveled Edge,  
Bread,  
Cabinet,  
File, Flat and Half Round,  
Flat Shoe,  
Flat Wood,  
Half-Round Shoe,  
Half-Round Wood,  
Horse, Plain and Tanged,  
Horse Mouth,  
Jig,  
Oval or French Shoe,  
Racer, Plain and Tanged.

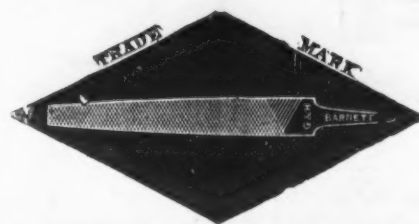
**SPECIALTIES.**

Butchers' Steels, Improved,  
Bent Rifflers, Handled,  
File Cards,  
File Brushes,  
Machinists' Scrapers,  
Stub Files & Holder, Detachable.  
Surface File Holder,  
Vise File Holder.

**NICHOLSON**  
**FILE CO.,**  
**PROVIDENCE,**  
**R. I.,**

**SOLE MANUFACTURERS.**

**Black Diamond File Works.**



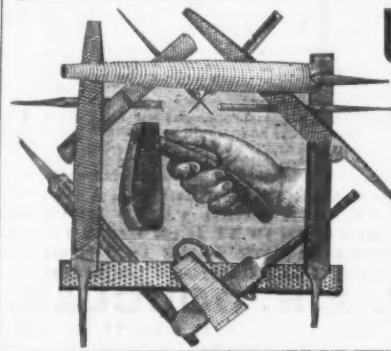
Awarded by Jurors of Centennial Exposition, 1876, for  
"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

**CHARLES B. PAUL,**  
Manufacturer of **HAND CUT FILES.**

Warranted **CASE STEEL.** 187 Tenth Street, Williamsburgh, New York.  
All descriptions of Files made to order. Price List mailed on application. Established 1863.



**UNION FILE WORKS,**

311 to 315 North St.,  
**BALTIMORE, MD.,**  
Manufacturers of

**FILES AND RASPS**

Made from the Best Refined Cast Steel.  
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

**MORITZ & KEIDEL, Agents,**  
48 & 50 German St., Baltimore, Md.

ESTABLISHED 1842.

INCORPORATED 1881.



CHAS. F. CRIPPS, President.

GILBERT PARKER, Treas. and Gen. Agent.

**THE J. BARTON SMITH CO.,**

Manufacturers of the Celebrated

**J. B. SMITH'S FILES, RASPS, WOOD SAWS, &c.,**  
211, 215 & 217 New Street, PHILADELPHIA.

New York Branch, 128 Chambers Street.

WM. H. BRAMHALL, Manager.

Prices the lowest. Goods the best.

Send for sample order.

**DODGE & BLAKE.**

**DODGE'S PATENT**

**FILE FORGING AND FILE GRINDING.**

These machines have long been in use in this country and in Europe, and are unexcelled for perfection of work and labor saving. We now offer them with the latest improvements, and will apply them to forging and grinding other articles of tapering or otherwise irregular form.

Works at Woodside, NEWARK, N. J.

**THRIFT FILE WORKS,**  
Manufacturers of all kinds of  
**Files, Rasps.**



Unexcelled in quality. Full weight and size.

**FILES**  
**JOHNSON & BRO.**

No. 1 Commercial Street, Newark, N. J.

**Grant Fan Mill & Cradle Co.**

Manufacturers of  
Grant's Grain, Coffee, Rice, Cochineal  
and Pimento Fans,

TURKEY WING GRAIN CRADLES,  
4, 5 and 6 fingers.  
GRAPE VINE GRAIN CRADLES,  
4 fingers.  
SOUTHERN PATTERN GRAIN  
CRADLES,  
4, 5 and 6 fingers.  
All of a superior quality.  
None genuine unless marked  
Grant Fan Mill and Cradle Co.  
Send for illustrated catalogue  
and price list.  
P. O. Address,  
MELROSE, Henssler Co., N. Y.



**THE SWIFT MILL.**

ESTABLISHED 1845.



The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

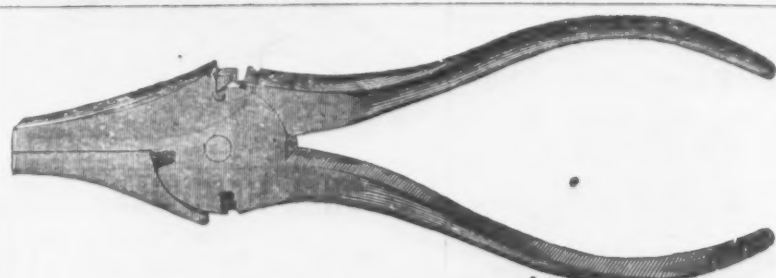
**ALSO LANE'S PORTABLE COFFEE ROASTER**

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

**LANE BROS., Millbrook, N. Y.**

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.



**J. M. KING & CO.**  
WATERFORD, N. Y.,

Manufacturers of the **BUTTONS PATENT**

**"WIRE CUTTER AND PLIER COMBINED."**

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps,  
Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Price List on application.

Established by DANIEL B. KING, 1839.



## A. FIELD &amp; SONS,

TAUNTON, MASS.,

MANUFACTURERS OF

AMERICAN AND FRENCH

## WIRE NAILS,

TACKS, SHOE NAILS,

And Every Variety of Small Nails.

Offices &amp; Factories at Taunton, Mass.

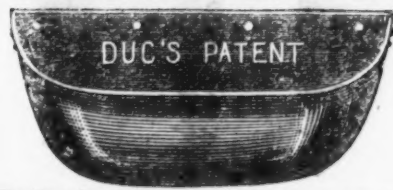
Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &amp;c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

## DUC'S PREMIUM ELEVATOR BUCKET.

ALWAYS FIRST  
COMPETITIVEPREMIUM IN  
TESTS.

This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 50 per cent. less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 300,000 are now in use by the principal Millers, Brewers, Distillers and Manufacturers at home and abroad. It is the best Bucket made.

**CAUTION.**—The popularity of the DUC BUCKET has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

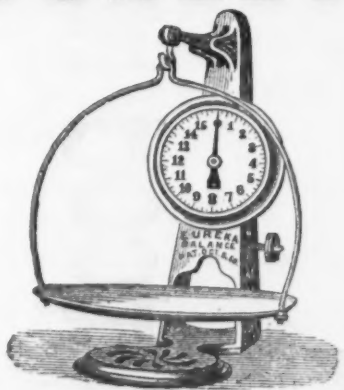
T. F. ROWLAND, Sole Manufacturer, Continental Works, BROOKLYN, N. Y.

**OLD COLONY RIVET CO., Kingston, Mass.**  
(Established 1866.)  
Manufacturers of NORWAY IRON RIVETS of Superior quality.

We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belt, Barrel, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President. HENRY HOBART, Treasurer.  
JAMES L. HALL, General Agent and Manager.

We carry the most complete stock in the city with our New York agents, *The American Tack Co.*, 115 Chambers St.

Eureka Self-Adjusting  
SCALES.

Have a patented attachment for ascertaining the tare of a dish or other receptacle used in weighing without the use of weights or loss of time.

Manufactured only by

John Chatillon &amp; Sons,

91 and 93 CLIFF ST., N. Y.

Send for Illustrated Price List.

**ESTERBROOK'S**  
STANDARD  
and  
RELIABLE  
STEEL PENS

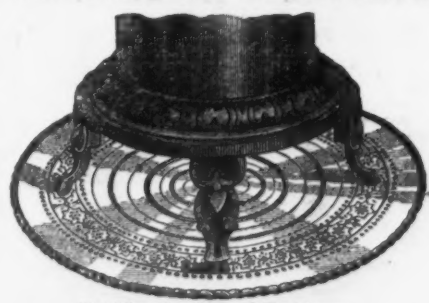
FOR SALE

BY ALL STATIONERS.



ESTERBROOK STEEL PEN CO.  
Works, Camden, N. J. 25 John St., New York.

## THE ANSONIA CORRUGATED STOVE PLATFORM

With Patented O. G. Border.  
ROUND ZINC.

27, 30, 32, 34, 36 inch.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discounts.

Packed 12 in each case.

## PURE ELECTRIC WIRE,

Manufactured by the

ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &amp;c.

Insulated on the bare wire with H. Spiltdorf's patented Liquid Insulation, covered with cotton or silk. All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Cash Bells, Bell Patches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

ESSEX  
HORSE NAILS.

Hot Forged, Warranted Best Quality, Pointed and Polished.

HOWE &amp; CO., Troy N. Y., Sole Agents.

despite the more extensive use of Spelter for galvanizing purposes in Europe. Business being, at the same time, of a dragging character at New York in the metal, the price gradually receded during the month from 5 1/4¢ to 5 1/2¢. March brought no relief, the market on both sides of the Atlantic remaining inanimate, prices keeping here between 5¢ and 5 1/4¢. In April news reached us from the West that production there had diminished somewhat, but although there was a slightly reviving demand with us early in the month, dullness prevailed later on and the price declined from 5 1/4¢ to 4 3/4¢. Europe became equally flat. In May the disappointment engendered by the poor spring season paralyzed the market among us completely, and with the little doing the metal gave way another 1/4¢, closing at 4 1/4¢ @ 5¢. Europe did not show any symptoms of recovery. Production in Germany was shown to have been 100,000 tons in 1880, against 97,000 tons in 1879. The import of Calamine from Spain into England had been 32,491 tons in 1880, against 27,613 in 1879. In the London market Spelter had stood £15. 15/ on April 1; on May 1 it was worth £15. 7/6, against May 1, 1880, £19. 15/; 1879, £14. 15/; 1878, £18. 18/; 1877, £20. 5/; and 1876, £24. No revival in the demand occurred in June; values were consequently sustained with difficulty at 4 3/4¢ @ 5¢. Europe meanwhile continued quiet, without giving way any further. In July a better feeling at length prevailed on both sides of the Atlantic. It was acknowledged that the use of galvanized goods had assumed unlooked-for proportions, and there was even some talk there of the renewal of the syndicate to cause a rise. The demand at the same time reviving slightly in this market, holders were able to raise the price to 5¢ @ 5 1/4¢. Parties interested in Spelter were, nevertheless, again doomed to disappointment for the time being, in spite of the moderate production in this country and a slight revival in the demand in the West for rolling purposes. Spelter kept at New York in August at 5 1/4¢ for Domestic, and 5 1/4¢ @ 5 1/2¢ for Silesian. In London the demand for India became a little brisker. In September more activity developed in Europe, London advancing to £15. 15/ @ £16, but in this market the listless state of affairs found no relief, the price ranging at the time between 5 1/4¢ and 5 1/2¢, for Domestic; and 5 1/4¢ @ 5 1/2¢, for Silesian. The import of Spelter into the United States during the first seven months had been 1,175,946 lb, against 5,743,343 in 1880, and the export 292,000, against 735,669; the import of Sheet Zinc, simultaneously, had been 1,375,497 lb, against 3,239,369, and the re-export, 16,586, against 33,867. At length the turning point was destined to come in the metal on both sides of the ocean, October inaugurating a notably improved demand. The same observations made in Europe with respect to the increased galvanizing demand were confirmed among us, and coinciding with greater activity in the rolled article, the metal attracted more attention. Consumers preferred to lay in a supply in time, and without the assistance of a syndicate. Spelter manifested a decidedly upward tendency in Europe likewise. Stocks there had run low, while the approach of the winter season held in prospect but a scanty supply from the Silesian mountain districts thenceforward. It thus occurred that amid greater activity the price advanced at New York from 5 1/4¢ to 5 1/2¢. The improved feeling thus inaugurated made further headway during the month of November, the price here rising to 5 1/2¢, and a greater volume of dealing being prevented here only by the restricted supply. London advanced from £16. 12/6 to £17. 12/6. During the first eight months the import of Spelter into the United States had been 1,297,199 lb, against 25,854,173 in 1880; the net import of Sheet Zinc, 1,442,141 lb, against 3,317,799, and the export, 795,413, against 1,479,452. Sheet Zinc had during the year gradually risen from 7¢ to 8¢ in November. December remained steady at 5 1/2¢ @ 6¢ with Common Domestic and Silesian, and Sheet Zinc at one moment brought as much as 8 1/2¢, but receded with some more supply from Europe to 8¢ @ 8 1/4¢. Domestic producers advanced their prices 15¢ @ 100 lb. London rose meanwhile with Spelter to £18. 10/. England's production of Zinc Ore last year was 27,548 tons, from which 7162 tons of metallic Zinc were made. Besides this, 43,177 tons of Ore were imported, Italy sending 11,028 tons; Greece, 11,485, and Algeria, 17,578, the balance all coming, we presume, from the North of Spain. The import of crude Spelter was 33,301 tons, 13,480 tons coming from Germany, 7993 tons from Holland in transit, and 9402 from Belgium. Besides this, 16,677 tons of manufactures were received, Germany contributing 3797; Holland, in transit, 6678, and Belgium, 5907. The export of Spelter and manufactures was 12,237 tons, of which British India took 7640 tons. Estimating the yield of slab metal from foreign imported Ore at the same figure as the domestic British, we find a production of 11,225 tons of metallic Zinc, and adding the import of Spelter and its manufactures, we find the total obtained from abroad to have been 62,203 tons, of which 12,237 tons were re-exported.

The import of Spelter into France, in millions of francs, has been as follows for the years named, the first column showing the whole year and the second the first seven months:

1881	1880	1879	1878	1877	1876	1875
756	234	77	187	14	16	6
756	234	77	187	14	16	6
756	234	77	187	14	16	6
756	234	77	187	14	16	6
756	234	77	187	14	16	6
756	234	77	187	14	16	6
756	234	77	187	14	16	6

This shows great steadiness. The export of Calamine from Spain has been:

1880	1879	1878
Tons. Value in francs.	Tons. Value in francs.	Tons. Value in francs.
32,491 1,786,995	27,613 1,507,781	33,532 2,011,954

This movement also exhibits considerable steadiness. The Silesian output of metallic Zinc has of late years increased at the rate of about 10% annually, say some 10,000 tons a year, which cannot be called a very rapid increase; but that portion of Prussia was in the habit of largely exporting Sheet Zinc to Russia, which export has been interfered with since the latter country raised the

duty, chiefly for the protection of the Polish production, for Poland near the Prussian frontier has its own mines and is roaring a home industry. Poland now produces between 4000 and 6000 tons of Spelter annually, but under protection this output may soon be doubled.

LOWEST AND HIGHEST PRICE OF COMMON SELLER.—CENTS PER POUND.

	1878	1879	1880	1881
Jan....	5 1/4 @ 6	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Feb....	5 1/4 @ 5 1/2	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
March...	5 1/4 @ 5 1/2	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
April....	5 1/4 @ 5 1/2	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
May....	4 3/4 @ 5 1/2	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
June....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
July....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Aug....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Sep....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Oct....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Nov....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2
Dec....	4 3/4 @ 5	4 3/4 @ 5	6 1/4 @ 6 1/2	5 1/4 @ 5 1/2

Tin Plates.

January opened with a reduced stock, while consumption gave signs of an early revival; holders, therefore, showed great firmness, in expectation of a good spring campaign. In England an equally firm feeling was noticeable. Ordinary brands Charcoal Bright stood at New York, \$5.87 1/2 @ \$6.25; ditto Ternes, \$5.25 @ \$5.37 1/2; Coke Tin, \$4.90 @ \$5; and ditto Ternes, \$4.90 @ \$5. In February, notwithstanding the severity of the winter, consumers operated with the utmost regularity, but the demand being more exclusively of a jobbing character, large lines moved off with comparatively less ease. In this manner a recoil of 25¢ per box occurred. Coke Tin closed at \$4.87 1/2 @ \$5. The import of Tin Plates into the United States in 1880 had been 3,160,976 cwt., worth \$16,518,113, against 3,085,014 cwt., worth \$13,227,659, in 1879. The strikes in Wales in March sustained prices in Liverpool, New York meanwhile drawing upon the stock at the latter place, steadily decreasing. As this coincided with a more active demand among us, the article recovered during the month 25¢, Coke Tin being worth \$5 @ \$5.25. It was therefore expected that with a continued curtailed supply in Wales and light stocks here, the rise would make some further progress in April; but in this holders were disappointed, the demand from the West being slacker than is usually the case during the spring. Our market thus kept quiet, without change in prices, Coke ranging between \$5.12 1/2 and \$5.25. This disappointment continuing into the month of May, Wales and Liverpool also felt the effect of it, causing the month to become a dull and sluggish one on both sides, everybody—the producer and the importer and dealer—complaining of momentary unprofitableness in the trade. The supposition was that consumers held larger stocks than had been presumed. In this manner the price receded 25¢, Coke closing at \$4.85 @ \$4.95. In June people began to take a more rosy view of the immediate future. The advices from Europe became more encouraging, and on this side the extremely low price stimulated the use of Plates. Although the general demand was steady and even progressive in point of volume, there was much irregularity in values, some species of Plates weakening and others looking up. Coke rose to \$5 @ \$5.10. Coke stood at Liverpool at 15/ @ 15/6, while here, with a fair demand, prices kept steady, stocks at the same time being only moderate in size, and Coke closing the same as the previous month—\$5 @ \$5.10. During the ensuing month (August) a fair jobbing trade was transacted, the demand running less on large lots, but the aggregate amount going into consumption being satisfactory, keeping stocks just within easy control, and leading to a slight appreciation in values. In Wales the output just about sufficed for the English and export demand. Some falling off in the use of Tin Plates for fruit canning was at this time apprehended, on account of the great drought and deficient crop. Liverpool cabled Coke Tin higher (16/6), stocks there and in Wales being much reduced. Coke Tin advanced in this city to \$5.10 @ \$5.15. The lessened consumption of Coke for fruit canning was at this juncture estimated at 150,000 boxes by some parties on this side. Others insisted that it had not diminished at all. September, at any rate, found our market in an apathetic mood, as it was thought that production had got the better of consumption for the time being. Meanwhile, however, the raw material had begun to rise in such a striking manner that it became evident the article was bound soon to resume an upward tendency in conformity therewith. After first declining 25¢ the market recovered somewhat, closing at \$5 @ \$5.10 with Coke Tin, while in October Liverpool kept fluctuating, with Coke Tin between 16/ and 16/6. The price at New York, with a fair amount of activity, gradually hardened, Coke closing at \$5.20 @ \$5.37 1/2. During the month of November everything seemed to concur to impart a fresh impulse to the demand and to prices. Wales, in the face of the rapidly advancing raw material, fell into quite an excitement and took a decided upward turn, the discovery being made that stocks everywhere diminished fast, especially in Liverpool. Ocean steam freights were raised between the latter place and this side from 10/ to 15/, and even at this advance goods tarried in coming over, being detained in many instances by head winds and unusually rough weather. The takings by consumption, meanwhile, continued on this side on a fair scale, and Coke Tin improved to \$5.37 1/2 @ \$5.50. In December, Coke Tin advanced in the New York market to \$5.87 1/2, there being no accumulation of stocks of Plates, and the foreign markets, at first excited, still remaining strong to the close of the month. Liverpool at the time cabled Coke Tin 18/, and Charcoal 20/ @ 22/. The net import of Tin Plates into the United States during the first 9 months of 1880 was 2,750,850 cwt., against 2,423,811 in 1879. The average price at Liverpool was, for Coke Tin, 22/8 @ box in 1875, 19/6 in 1876, 17/8 in 1877, 15/1 in 1878, 19/5 in 1879, and 18/8 in 1880, the average of the ten years ended December 31, 1880, being 23/.

TOTAL EXPORTS OF TIN PLATES FROM GREAT BRITAIN.

Year.	Tons.	Year.	Tons.
1871.....	110,666	1876.....	132,564
1872.....	118,083	1877.....	153,226
1873.....	120,668	1878.....	155,240
1874.....	122,950	1879.....	157,849
1875.....	138,163	1880.....	177,699

The following tables will show the average range of prices of tin plates (ordinary



# RUSSELL & ERWIN MANUFACTURING COMPANY,

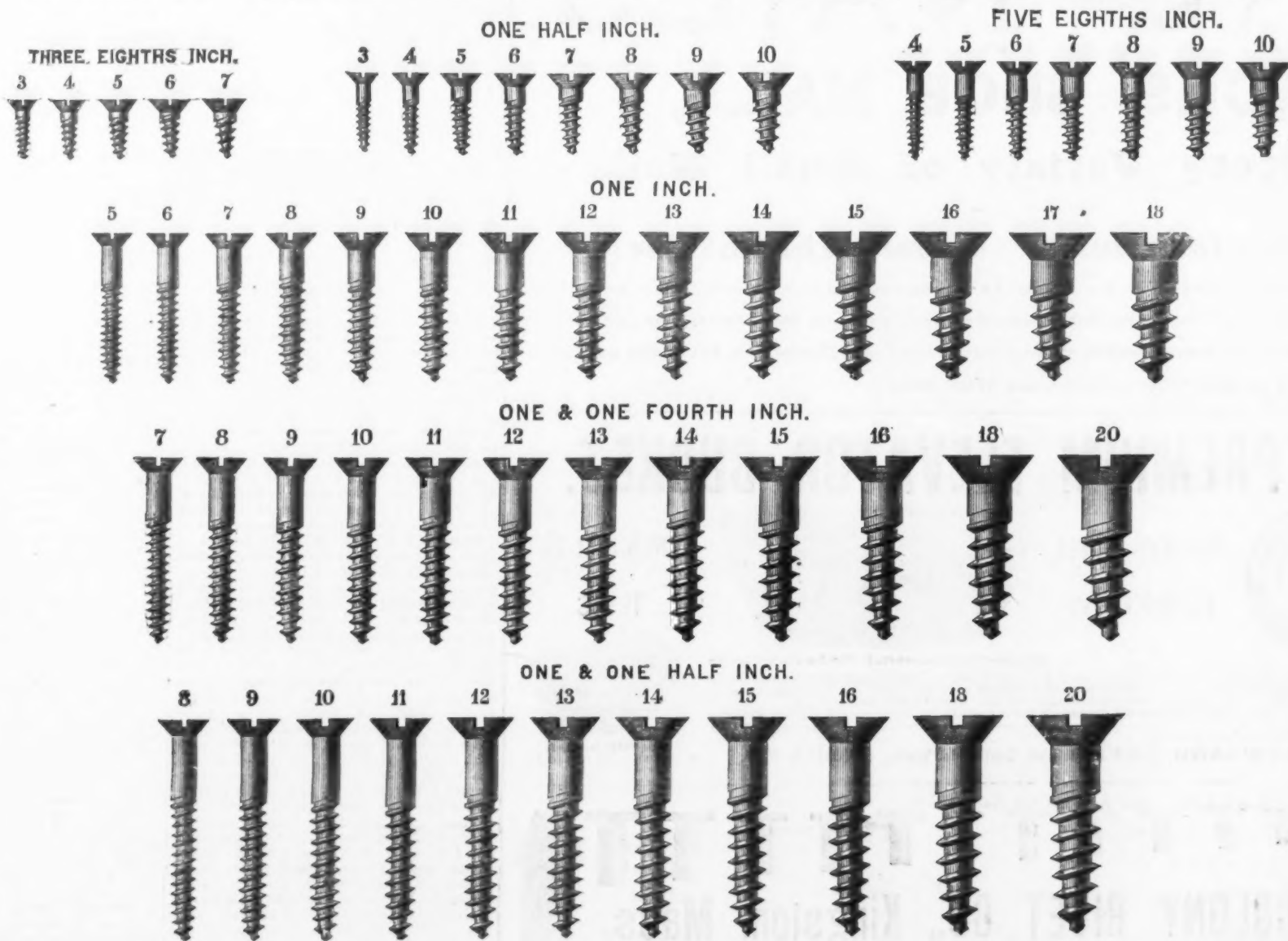
New Britain, Conn., U. S. A.

Manufacturers of **BUILDERS' AND OTHER HARDWARE,**  
IRON AND BRASS WOOD AND MACHINE SCREWS.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

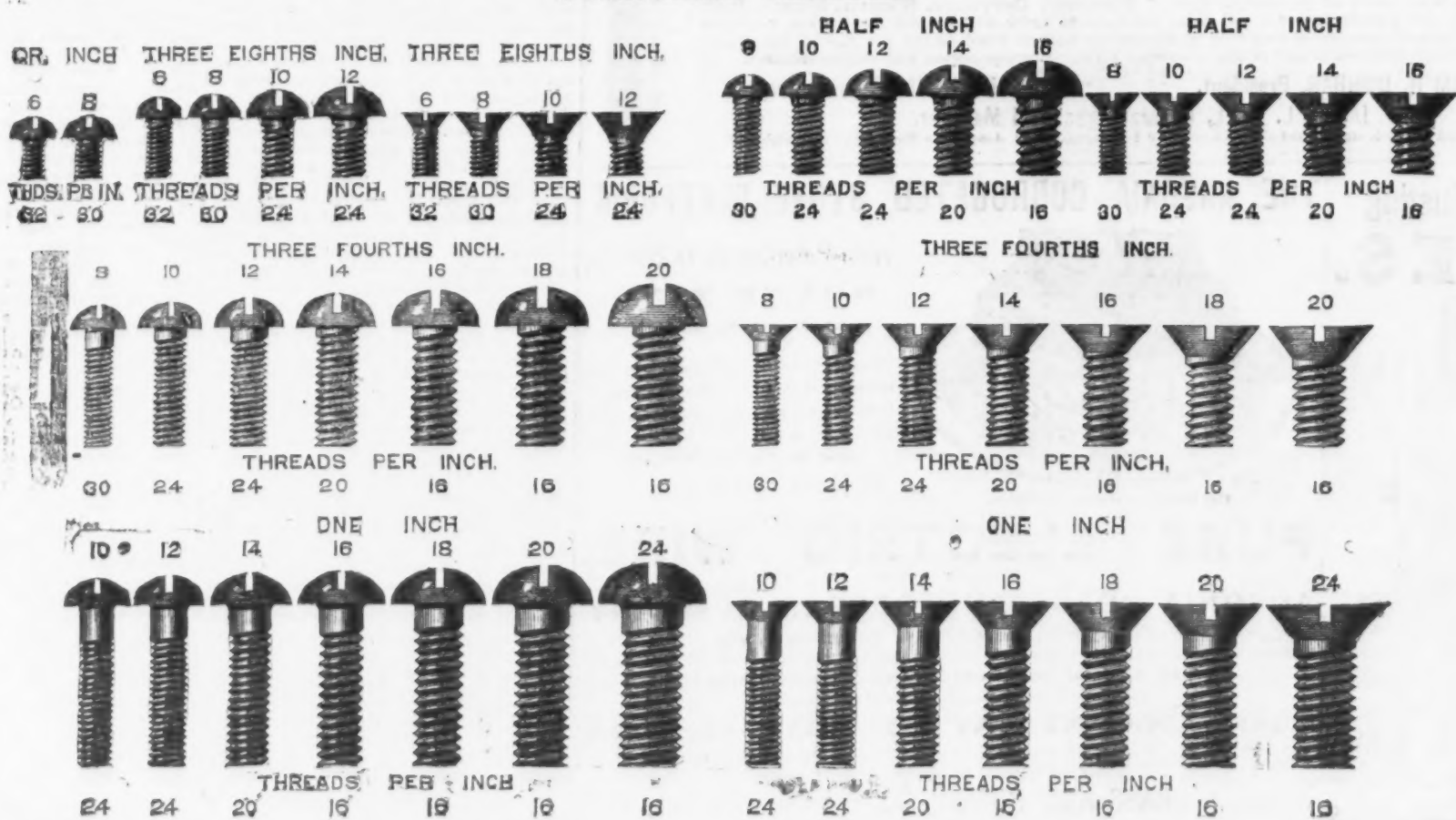
WAREHOUSES: NEW YORK, 45 & 47 Chambers St.; PHILADELPHIA, 425 Market St.; BALTIMORE, 17 South Charles St.; LONDON, 47 Upper Thames St.

## IRON AND BRASS WOOD SCREWS.

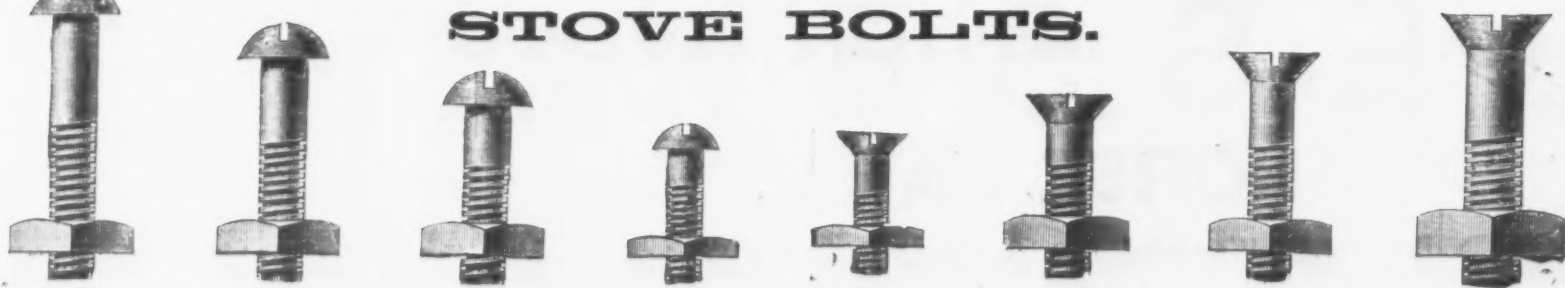


## IRON & BRASS MACHINE SCREWS.

STANDARD THREAD.



## STOVE BOLTS.



DOOR  
AND  
PAD  
LOCKS

DOOR  
KNOBS

&C.

REAL KAHALA AND ROHIDA BRONZE DOOR FURNITURE.



S. B. 1800. M. L. B. 1845. M. L. B. & CO. 1856. B. & A. 1867. B. & A. 1881.

# BRADFORD & ANTHONY,

BOSTON, Mass.

Continue with a fuller stock than ever before the business which has been conducted without interruption for eighty-one years, as

IMPORTERS, MANUFACTURERS' AGENTS,  
AND WHOLESALE DEALERS IN

American, English, German, French and Swedish

# CUTLERY, SKATES AND FISHING TACKLE.

Sole selling agents for the United States for **ENGSTROM'S SWEDISH RAZORS**.  
Sole selling agents for the United States for **Starr Man'g Co.'s ACME SKATES**.  
Sole selling agents for **WINLOW'S POPULAR SKATES**, Wood Tops, Clubs, All Clamps,  
and Ladies' Skates, Popular Roller Skates, Park Roller, Improved Circular Running Vineyard  
Rollers.

Sole selling agents for **ROBERT MURPHY'S** Corkscrews, Oyster Knives, Shoe Knives, Rubber  
Knives, Butter and Cheese Tryers and Steel Implements.  
Sole selling agents for **D. ROBERTS'** Nickel-plated and Japanned Handle Shears and Scissors.  
Sole selling agents for New England, for **H. HEINISCH'S SONS'** American Shears, Scissors and  
Trimmers.

Sole selling agents for New England, for the **STAR SCISSORS COMPANY'S** Nickel-plated  
Ladies' Scissors, Trimmers, &c.

**JOHN RUSSELL CUTLERY CO.'S** Table Cutlery, Pocket Knives, Butchers', Painters',  
Druggists' and Household Cutlery, Silver-plated Forks and Spoons.

**JOSEPH RODGERS & SON'S** Table Cutlery, Pocket Knives, Scissors, Razors, Erasers.

**GEORGE WOSTENHOLM & SON'S** Celebrated IXL Pocket Knives, Razors, Farriers' Knives.

**JONATHAN CHOOKE'S** Pocket Knives.

**WADE & BUTCHER'S** Celebrated Razors.

**FREDERICK WYNOLD'S** Razors.

**THOMAS H. CADMAN'S** BENGALL Razors and Razor Blanks.

**NEEDHAM BROTHERS'** "Repeat" Pocket Knives.

Sole selling agents for **NEW ENGLAND KNIFE CO.'S** Pocket Knives.

Sole selling agents for **BARCLAY & BROS.** Pocket Knives, Scissors.

Sole selling agents for **HARBER BROS.** Pocket Knives.

**JOHN NOWILL & SON'S** Scissors.

**JAMES CHESTERMAN & CO.'S** Measuring Tapes.

Sole selling agents for **BADGER'S RAZOR STRAPS**.

Sole selling agents for **UNITED STATES FISH HOOK WORKS**.

Sole selling agents for the **FISHING LINES** bearing the Trade Mark, "Best Quality Hand  
Laid Linen and Silk Lines," which received Centennial Medal for "strength and care  
taken in manufacture."

Sole selling agents for the **Patent Adjustable Floats and Sinkers**.

Importers of Calcutta and Japan Bamboo Poles, Fish Hooks, Swivels, Silver  
Fishing Gimp, Spanish Silk Worm Gut.

Selling agents for the Best Manufacturers of **Jointed Fishing Rods, Braided Fishing  
Lines, Fishing Reels, Artificial Baits, Patent Pocket Flasks, Hammocks**.

COMPRISED IN ABOVE ARE

More than 1130 Different Patterns of **POCKET KNIVES**.

More than 500 Styles and Sizes of **SCISSORS AND SHEARS**.

More than 150 Patterns of **RAZORS**.

More than 750 Kinds of **TABLE CUTLERY**.

And all other articles of **CUTLERY** in great multitude.

And over 445 Kinds and Sizes of **FISHING LINES**.

55 Patterns (over 950 Different Kinds and Sizes) of **FISH HOOKS**.

155 Styles of Fishing Rods. 120 Patterns Fishing Reels. 350 Varieties of Artificial Bait.

Lists of Murphy's Steel Goods, catalogues of our Skates, catalogues of our Fishing  
Tackle Stock will be mailed on application to dealers in these lines of goods.

See Copartnership Notice on Page 22.

BRADFORD & ANTHONY, Boston, Mass.

**RICHARD DUDGEON,**

No. 24 Columbia Street, New York.

Maker and Patentee of the improved

**Hydraulic Jacks**

AND

**Punches.**

Roller Tube Expanders and Direct Acting Steam Hammers.

Communications by letter will receive prompt attention.

Jacks for pressing on Car Wheels or Crank Pins made to order

Our specialty Also, Castings, Finales and Vases, Stable Fixtures, Hitching Posts, Door and Window Guards

Wrought-Iron Gratings, Fire Escapes and Ladders, Jails, &c. Our Fencing can be shipped to any part of the

United States, and can be set up by the purchaser at small expense. Our prices are reasonable. Corre-

spondence and notice of public buildings solicited. Every Hardware Dealer should have our

Catalogue. Address **CLEVELAND WROUGHT IRON FENCE WORKS,**

Office, 21 Water Street, near Union Depot, CLEVELAND, OHIO.

**BRASS FOUNDERS**

of the

**SOUTH.**

We have formed an agency for the sale of our goods in

Richmond, Va., where they can be furnished at factory

prices, saving time and freight. Every crucible

shipped by us fully guaranteed. Please remember that

the quality of our goods is not equalled by any other

maker. Send your orders to

**ASA SNYDER,**

1008 Carey Street,

RICHMOND, VA.

**THE CINCINNATI BARBED WIRE FENCE CO.,**

JAS. LARMON, Pres't. 52, 54, 56, 58 & 60 New Street, CINCINNATI, OHIO. C. W. COLE, Sec'y.

Cables and Barbs warranted all steel.

LICENSED MANUFACTURERS OF

**FOUR-POINTED BARBED WIRE FENCING.**

We have large stock of Galvanized, Red and Brown Painted Barbed Wire on hand, and can fill all orders

promptly. Send for sample and prices.

**RHODE ISLAND HORSE SHOE CO.,**

MANUFACTURERS OF

**Horse, Mule & Snow Shoes of the Perkins Pattern.**

Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.

F. W. CARPENTER, President C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK, Secretary

brands) at New York on the 1st of each month, 1879 and 1880.

1879.

January.....	\$5.33	July.....	\$5.50
February.....	5.70	August.....	5.40
March.....	5.75	September.....	5.57
April.....	5.67	October.....	5.66
May.....	5.66	November.....	7.28
June.....	5.43	December.....	7.11

1880.

January.....	\$5.11	July.....	\$5.49
February.....	5.72	August.....	5.79
March.....	5.68	September.....	5.78
April.....	5.60	October.....	5.46
May.....	5.75	November.....	5.40
June.....	5.85	December.....	5.39

PREVIOUS PRICES.

July 1, 1874.....	\$8.71	February 28, 1878.....	\$5.66
April 28, 1876.....	6.58	March 31, 1878.....	5.66
May 5, 1877.....	5.97	April 30, 1878.....	5.72
September 7, 1877.....	6.00	May 31, 1878.....	5.37
October 19, 1877.....	5.97	June 15, 1878.....	5.35
December 20, 1877.....	5.85	July 15, 1878.....	5.33
December 31, 1877.....	5.77	October 3, 1878.....	5.18
January 1, 1878.....	5.75	December 18, 1878.....	5.28

## INDUSTRIAL ITEMS.

### MAINE.

The Katahdin Furnace is in blast and making 120 tons per week. The product is sold ahead. The Bangor and Katahdin Iron Works Railway, 20 miles long, to establish rail communication with the furnace, is fast approaching completion.

The Atlantic Horse Nail Company has been organized at Portland for the purpose of manufacturing and selling horse nails; capital, \$100,000.

### RHODE ISLAND.

The Woonsocket Machine Company have just started a new 100-horse power Harris-Corliss engine, with boiler set in the new Hawkins setting. They have recently made large additions to their foundry, erected a new blacksmith shop, and added very many new special tools, some of which were imported from England. About 300 men are employed, one-third of the number being engaged in the shafting department. The company have averaged ten cotton looms per day during the past season, and hope to exceed that number the coming spring. A new extension, devoted exclusively to shafting, is about to be built, which will give this company by far the largest amount of space and number of tools, devoted to shafting exclusively, of any similar concern east of Philadelphia. A large number of trimmings and inspecting machines are being built, the company controlling that specialty.

The Rhode Island Locomotive Works, at Providence, have received orders for the construction of ten new extra-fast locomotives for the Grand Trunk Railway, in addition to the new first-class passenger coaches in course of construction for the same company.

### CONNECTICUT.

The Bridgeport Brass Company expected to be in active occupation of their large extension about January 1. Business is booming and seems to promise well for the future.

### MASSACHUSETTS.

Silver & Gay, machinists, of North Chelmsford, are busy on orders for quillers, reels, ballers and other machinery for which their works have long been known. Their new and improved balling machines for balling all kinds of material are having a large sale, and they find it difficult to keep up with their orders for them. A feature of their establishment is the convenience for doing heavy machine work, few concerns being better fitted for that purpose.

The new tack plate mill of the Old Colony Iron Company, at East Taunton, will be ready to run some time in January next. The mill is 180 feet long by 130 feet wide. It has an engine of 350 horse-power from the Corliss Works at Providence, and when completed will employ 75 men.

The Phoenix Machine Company, Lowell, has shipped this week the twisters, &c., to the Pioneer Mill, Memphis, Tenn. They now have nearly ready for shipment a large number of their patent expansion reed and comb and other patent specialties.

Boston and New York parties will, it is reported, soon start the old Agawam Nail Works, situated in East Wareham.

The bolt works of Shelton & Co., in Shelton, have been burned; loss \$30,000; insured.

### NEW JERSEY.

But one of the Spiegel furnaces of the New Jersey Zinc and Iron Company is at present in blast. Another will be blown in this month. The stack now in blast is making 60 tons per week.

A new electric light company has recently been formed under the State laws of New Jersey, and is known as the Atlantic and Pacific Electric Light Manufacturing Co. Its works and main office are at Front and Pearl streets, Camden. Among the improvements claimed by this company the following may be mentioned: In the dynamo-electric machine a new compound field magnet, adapted to give five times the effect of the magnet as used upon other machines. An armature adapted to be taken apart and repaired wherever it may be, and thereby dispensing with the necessity of sending it back to the works for repair; also an electric current governor, a device arranged to form part of the dynamo-electric machine, and to automatically regulate the electricity taken off the machine, to the end that the internal and external electrical resistances shall be equal, thereby making it impossible to injure the dynamo machine should 49 lights be suddenly turned out upon a circuit of 50. They claim other improvements and are working under patents.

### PENNSYLVANIA.

Business changes in the iron trade in Philadelphia are very few this year, and so far as advised, are as follows: D. W. R. Read & Co., ores, &c.—Mr. T. Horace Brown retires; Mr. Read continues the business alone. Sites & Gill, metals—Mr. Thompson C. Gill admitted as partner. N. & G. Taylor Co., tin plates—Mr. Nathan A. Taylor, George W. B. Taylor, and Hollinshead W. Taylor admitted as partners. Merchant & Co., tin plates, have opened an office at New York, corner

of Cliff and Beekman streets. Williamson & Cassidy, 24 S. 4th street, Philadelphia, have been appointed sole agents for the Page Belting Co., Concord, N. H. The numerous friends of the old-established firm of Knight & Smith, Philadelphia, will regret to hear of the sudden decease of Mr. Caleb H. Smith. Mr. Smith went down to their place of business on Monday, and was taken with an apopleptic fit and died before he could be carried home. He was fifty-five years of age and much respected.

A very disastrous fire took place in Philadelphia during the closing hours of the old year. The five-story building at Fourth and Race streets, which was put up about two years ago, suffered damage to the extent of about \$150,000. Cox & Sons, engine builders and manufacturers of plumbers' fittings, and the Keystone Portable Forge Co. occupied one of the lower stories, and suffered some loss. Their business will not be interrupted, however, as both firms have their patterns at the works at Bridgeton, N. J. They inform us that all orders can be filled with the usual promptness.

The year just closed has been a busy one at the Baldwin Locomotive Works. The whole number of locomotives built during the year 1881 was 555, or at the rate of two every working day. Of this number 88 were built for export to foreign countries as follows: To Australia 15, Brazil 16, Mexico 48, Cuba 4, Central America 2, Peru 1, Sandwich Islands 1. In 1880, 517 locomotives were built, 53 of which were for foreign account. In 1879, 398 were built, 90 of which were for foreign account. It was in the autumn of 1878 that the present business activity began; from 1874 to 1878 the works were only partially employed. In 1873 the works were running at their then full capacity, and the product of that year was as follows: Whole number built, 437, of which 85 were for railways outside of the United States. About 2800 hands are now employed in the establishment.

Danville Furnace No. 2, blown in on December 1 for the first time since 1872, is doing well, but has not yet gotten fully to work.

At Bennington Furnace, near Gallitzien, owned by the Blair Iron and Coal Company, a strange accident is reported to have occurred last week. The gas escaped from the furnace in large quantities and pervaded the property to such an extent that all the employees, together with a number of residents near by, were asphyxiated by it, and had to be removed from the vicinity of the furnace. The escape was checked and the persons affected have since recovered.

Messrs. Raney & Burger, furnacemen of New Castle, have purchased the coke ovens in that city. There are 80 ovens in all, and they will be started up immediately.

The Lehigh and Wilkesbarre Coal Company was last week taken out of the hands of the receivers, by order of Judge McKennan, in the United States Circuit Court. The injunction against it, granted on petition of its creditors when it became insolvent, was dissolved, and it is once more on its feet a solvent corporation. The petition for the decree was presented in April, 1880, showing that the company was able to satisfactorily take care of the interests of its creditors without the control of the Court. The receivers filed an answer at the same time and the matter was referred to Joseph A. Gray as master, who reported that the petition should be granted. The Court did not make the transfer at the time, but a supplemental petition was presented and the order made as stated.

Fifty-eight new coke ovens were fired up at the works of the Chicago and Connellsville Coke Company, in the Connellsville region, last week. They are now shipping 20 cars per day.

At Miller, Printz & Co.'s Iron Works, Reading, drilling lathes are being built for Jacobus & Nimick, Pittsburgh; hat machinery for Fitchorn, Redway & Co.'s hat factory, Adamstown, and several 30-horse-power horizontal engines. They are also doing a great deal of repair work.

The Parker Glass Co., Parker City, Armstrong County, are doing a big business. They have now very fine facilities for shipping goods, a point in which they were weak at first, and which incommoded them a good deal. In some respects their shipping conveniences are now superior to those of many of the Pittsburgh houses.

A Norristown company of capitalists bought the Old Fulton Rolling Mill property there from the Philadelphia and Reading Company. The stockholders have formed a new company to be known as the Standard Iron Company, Limited, with a capital of \$75,000, ten per cent. of which is now payable to the treasurer.—Reading Eagle.

Messrs. Loose, Seaman & Co., who have recently bought Derr's plow works, at Hamburg, and named them the Hamburg Plow Works, are making extensive repairs and preparations to start on January 10, 1882. They are building a new pattern shop and engine house. The pattern shop will be fireproof. A 20-horse engine will at once be erected by Orr, Painter & Co., of Reading. The firm expect to employ about 20 men.

The erection of the Penn Hardware Company's new building, in Reading, will be commenced as soon as possible after the first of January. Over 200,000 bricks have been already delivered. The new building will have a front of over 200 feet, will contain four foundries, and give employment to some 600 hands when in full operation.

The Isabella Furnace will be put in blast again very shortly.

### PITTSBURGH AND VICINITY.

The Junction Railroad Company have purchased a large tract of land known as Wainwright's Island, which has 2800 feet of river front. This will be used as a transfer station in connection with the Baltimore and Ohio and the Pittsburgh and Western roads, and the trains will be made up here. The river frontage will be very useful for the transfer of cars by barges, similar to the present plan of the Pittsburgh and Lake Erie. This is about the last available depot property in the city. The Pittsburgh and Western road recently purchased four acres of land near the Pittsburgh Locomotive Works for yard and depot purposes.

Thomas Coffin & Co., clay-pot manufacturers, have a large number of orders on hand, and they are pushed to fill them. They are now shipping pots to Cuba and Mexico. The factory is working to its utmost capacity and is barely able to meet the demand.

The Chartiers Glass Company are running full time and business is very fair. They make bottles, wines and flasks.

The case of Charles W. Cass, who applied for an injunction against the Manchester Steel and Iron Company, has been decided in favor of the applicant, the company being enjoined not to lease or rent the property until after the stockholders' meeting in January.

The Iron City Bridgeworks, established with business. They are their lower shops at Chartier, Pittsburgh and Lake Erie Railroad, about January 1.

The Brushton Glass Pot Works of Rosencize, Maloney & Co. are very busy. They have pots of all sizes and kinds, both flint and window, now ready for delivery. They have 32 hands employed steadily at the works and are running full time.

The rumor that the Crescent Steel Works had purchased a large tract of land to erect additions to their works is contradicted by the proprietors, Messrs. Miller, Metcalf & Parkin.

The old water works engines have been compelled to start up, in order to keep the supply of water from getting low. The new works are being repaired as fast as possible.

The Royal Flint Glass Bottle Works continue to do a good business, and things are prospering with them. Their office and factory are at West Bridgewater, Beaver County, Pa.

The work of rebuilding the Millvale Iron Works, destroyed by fire a few weeks ago, has been commenced, and is being pushed forward night and day. They have purchased a portion of the Main Centennial Building for this purpose.

### WEST VIRGINIA.

Mr. Joseph Woodward has been elected President of the La Belle Iron Works, of Wheeling, to succeed Mr. W. H. Woodward, who has resigned. It is understood that Mr. W. H. Woodward has completed arrangements to go into the manufacture of iron on a large scale near Birmingham, Ala., and will erect a very well appointed and complete furnace there at once. His father, the late S. H. Woodward, left a large quantity of iron and coal lands in that State, and it is proposed to utilize the products of these.

### ILLINOIS.

Stack No. 1 of the Joliet Steel Company is blowing at the rate of 780 gross tons per week. No. 2 will blow in a few next month.

Quinnimont furnace went out of blast, but expected to blow in again about January 1.

The annual meeting of the stockholders of the Chicago Steel Horseshoe Company was held recently. The following directors were elected to serve the ensuing year: Charles R. Barton, Thomas S. Chard, S. H. Etheridge, W. B. Ullmann and William R. Kerr. At a meeting of the new directors, held after the meeting of the stockholders, William R. Kerr was elected president and W. H. Ullmann, secretary and treasurer. It was voted unanimously by the stockholders to increase the capital from \$100,000 to \$150,000. The company's works, which are located at Pullman, are a recent addition to that thriving city, and the growth of the business has been such that the company has been unable for some time to keep up with its increasing orders. In addition to making steel horseshoes it has lately added "drop forging," a new enterprise in the West. In fact, there are but three other establishments in the country where the process is carried on.

Mr. Hervey W. Fowler (late of the firm of Fowler & Sellers) has purchased the site for a large rolling mill at Englewood, some two miles south of the Chicago city limits, where he will at once erect the necessary buildings. The mill will make a specialty of re-rolling old railroad iron, and manufacturing spikes, bolts and fish-bar plates. He expects to have the buildings erected and the machinery on the ground within 90 days, which will cost not less than \$30,000. When in operation the works will employ from 100 to 150 hands. The Western Indiana Railroad Company has already taken measures to lay tracks from their main line to the new rolling mill works.

### MISSOURI.

The Hoyt Metal Company, St. Louis, report trade excellent. They are having some marked improvements made at their works, which will increase their capacity 50 per cent.

The St. Louis Bolt and Iron Company are running their establishment day and night on orders for fish plates, bolts, spikes and light rails.

The Helmbacher Forge and Rolling Company are about putting in new machinery for welding railroad coupling links. The works are giving employment to about 275 men.

The Duggan-Parker Hardware Manufacturing Company are working 45 men and have orders ahead for several months. They contemplate enlarging their works in the spring.

The Globe Fire Works, of North St. Louis, employ 16 men, and re-cut and manufacture between 12,000 and 15,000 files yearly. A 25-horse-power engine has recently been put in. Orders for files are received from places as far distant as Denver, Col., and Galveston, Tex.

### ALABAMA.

Sloss Furnace, now under construction, is nearing completion. This furnace will have a plant of 200 coke ovens in connection with it which are now almost finished.

The Birmingham Rolling Mill Co. are running their mill double turn with orders ahead until April.

### KENTUCKY.

Every department of the Norton Iron Works is in full blast and working smoothly. Full time was not made last week, the mill factory only turning out 3673 kips of nails. The blast furnace is in good working order, making her daily average of over 50 tons of good iron.

Pennsylvania Furnace, Greenup County, is doing her usual good work, putting out a



# H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

## BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

## SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

PLATTSBURG, N. Y.

W. S. GUIBORD, Secretary.

ELY & WILLIAMS, Gen'l Agents for Eastern and Middle States, 1232 Market St., Philadelphia; 178½ Water St., New York.

36 Oliver Street, Boston. S. H. & E. Y MOORE, Gen'l Agents for Western States, 163 and 165 Lake Street, Chicago, Ill.

SAM'L G. B. COOK & CO., Agents for Southern States. Nos. 67 and 69 (old Nos. 5 and 7) German Street, Baltimore, Md.

SARANAC HORSE NAILS,

Blued or Polished.

Terms, Cash, within 60 Days.

Nos.	5	6	7	8	9	10
Cts.	26	23	21	20	19	18

HARTLEY & GRAHAM, 17 & 19 Maiden Lane, NEW YORK,

Agents for the "ROBIN HOOD" REVOLVERS.

STEEL BARREL AND CYLINDER.

22, 32, 38 and 41 CALIBRE.

Cal., Short or Long Cylinder.

Wood, Rubber Ivory and Pearl Handles.

Plain or Fluted Cylinders.

Round or Octagon Barrels.

Plain Finish, Engraved or Enameled.

FOR JOBBING TRADE.



ROBIN HOOD No. 1, 22 Cal.

32 Cal. Long Fluted Cylinder.

Wood, Rubber, Ivory or Pearl Handles.

Round or Octagon Barrels.

Plain or Saw Handle.

Plain Finish, Engraved or Enameled.

FOR JOBBING TRADE.

### COBB & DREW

Plymouth, Mass.,

Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,

GRUNDY & DISOSWAY,

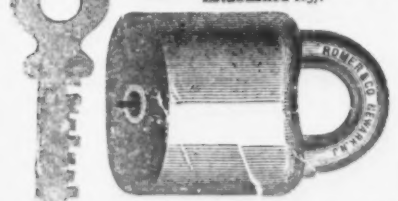
HARDWARE,

165 GREENWICH STREET,

Agents for the Philadelphia Star Carriage and Tire Bolts.

Romer & Co.

Established 1837.



Manufacturers of Patent Scandinavian or Jail Locks, Brass Pad Locks for Railroads and Switches.

HANDCUFFS AND LANTERNS.

Also Patent Stationary B. R. Car Door Locks.

131 to 141 Railroad Avenue, NEWARK, N. J.

Illustrated Catalogue sent to the trade on application.

AXLES

All kinds Wagon & Carriage Axles

Manufactured by the

LAMBERTVILLE IRON WORKS.

LAMBERTVILLE, N. J. Send for prices.

MINERS' CANDLES.

Superior to any other Light for Mining

Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., New York.

### The Boss Lemon Squeezer.

Malleable Iron and

Tinned (pure Tin).



Acknowledged the Best.

Patent Applied For.

JOHN J. TOWER, 96 Chambers St., New York.

ORDER EARLY.

Torrey's Door Springs.

S. ROEBUCK & CO.,

Manufacturers,

164 Fulton St.,

NEW YORK.

Torrey's Patent

COG WHEEL

Ice Cream

Freezers.

Torrey's Door Springs.

S. ROEBUCK & CO., Manufacturers.

164 Fulton St., New York.

CHAMPION

HOG RINGER

RINGS and HOLDER.

Only doubling ring ever

invented. The only

ring that will effect-

ually keep Hogs from

rooting. No sharp

points in the nose.

Rings, 75c. Rings, 10c. 100. Holders, 75c. Huskers, 10c.

CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.



EAGLE BILL

CORN HUSKER

Is the best Husker in the

market. Farmers say it

is the best. Use no other.

Only single Ring in

the market that closes

on the outside of the

nose. No sharp points

in the nose to keep it

sore.

### BROWER & LEEDS,

No. 81 Murray St., NEW YORK,

Sole Agents in the United States for

JOHN BAYLISS' CELEBRATED HURRICANE BELLOWS,

"LITTLE GIANT" PORTABLE FORGE and BELLOWS,

HOT BLAST AND WATER TUYERE IRONS,

HORSE SHOERS' PINNERS and SHOEING HAMMERS,

TURNING HAMMERS AND SLEDGES, and CONTRACTORS' TOOLS.

### GEORGE J. RECORD'S SAP SPOUT



Consists of two tapering tin tubes, the edges being one against the other. One tube is forced inside the other, so that the joints come on opposite sides of the spout and are firmly held by a flange forced on about midway. It is then retinned, which welds it into one solid tube. The rim is flange shaped (which is shown separately in cut), widest on the upper side, thus requiring a smaller hole in the sap pail, therefore the pail cannot be dislodged or swung about by the wind. The cuts represent the full size.

One cut shows the spout full size, and the other the manner of using.

DIRECTIONS.—Bore hole in tree with ¼ in. bit, drive spout with wide side of flange up. Punch a ¼ in. hole in tin sap bucket, and hang back of flange on spout, as shown in cut.

For wood bucket, nail small ring on inside of bucket and hang on spout same as tin. To empty the sap tip bucket, as represented.

This spout is not only one of the cheapest, but the strongest and best sap spouts made, and will last a lifetime, and the tree will yield the largest flow of sap. Net wholesale price, \$2.50 per 100. Put up in paper boxes, 100 in each. Address orders to principal jobbers or to

RECORD MANUFACTURING CO. Conneaut Ohio.

### DAVID HYMES & CO.,

92 Church Street, New York,

JOB LOTS OF HARDWARE & CUTLERY.





## SPENCER & UNDERHILL,

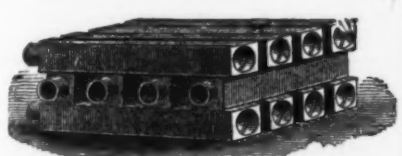
94 Chambers St., New York, Agents for  
American Screw Co.'s Wood Machine and  
Rail Screws, Stove and Tire Bolts, Rivets, &c.  
G. F. Warner & Co.'s Carriage Clamps.

### DEPOT FOR

O. Ames & Son's Shovels, Spades and Scoops.  
A. Field & Son's Tacks, Brads, Nails, &c.  
Nicholson File Co.'s Files and Rasps.  
W. & S. Hatcher's Chisels, Gouges, Plane  
Irons and Cleavers.  
E. W. Gilmore & Co.'s Strap and T Hinges.  
Russell Jennings' Auger and Dowel Bits.  
Also a general assortment of Hardware.

## A. WYCKOFF,

Manufacturer of



## WOOD WATER PIPE

For Coal and Iron Mines.

Send for pamphlet.

## A. WYCKOFF, Elmira, N. Y.

## R. COOK & SONS,

Manufacturers of

## Carriage & Wagon AXLES,

WINSTED, CONN.

ESTABLISHED - - - 1839.

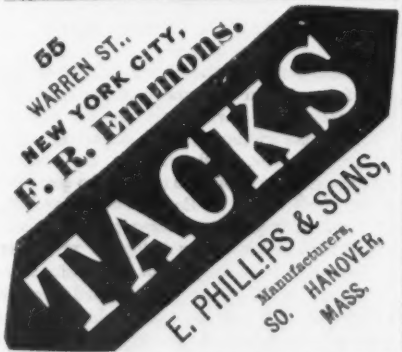
## N. Y. Mallet and HANDLE WORKS



Manufacturers of  
Calkers', Carpenters', Stone Cutters',  
Tin, Copper and Boiler Makers'

### MALLETS,

Hawking Beetles, Hawking and Calking Irons;  
also all kinds of Handles, Sledge, Chisel and Ham-  
mer Handles, &c.  
COTTON AND BALE HOOKS.  
Patented Feb. 15, 1877; a new combination of Hooks.  
436 E. Houston St., New York City.



The Patent Combined  
Dinner Pail and  
Lantern.

The most perfect Dinner Pail  
in the world. Hot coffee for  
dinner and a Lantern at night.  
Manufactured by JOS. HAIGHT,  
PORT CHESTER, N. Y.  
Sent by express on receipt of  
\$1.00. Agents wanted.

## Keystone Screw Co.

17th and Venango Streets,  
PHILADELPHIA.

J. BILLERBECK,  
Manufacturer of

## W. & J. TIEBOUT,

Manufacturers of

## Brass, Galvanized & Ship

## Chandlery Hardware,

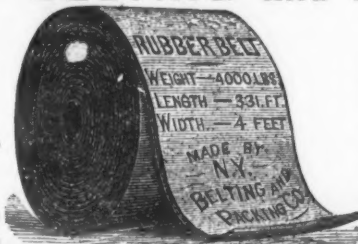
No. 33 Chambers St., New York.

## Vulcanized Rubber Fabrics

ADAPTED TO  
MECHANICAL PURPOSES.

## RUBBER BELTING and PACKING.

Machine Belting,  
Steam Packing,  
Leading Hose,  
Suction Hose,  
Grain Elevator  
Belting,  
Steam Hose,  
Piston Rod  
Packing,  
Gaskets and Rings,



Vacuum Pump  
Valves,  
Ball Valves,  
Car Springs,  
Wagon Springs,  
Gas Tubing,  
Machine Belting,  
Wringer Rolls,  
Billiard Cushions,  
Grain Drill Tubes,  
Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham  
Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for  
Armour, Dole & Co., Chicago, and Vanderbilt's great elevators of the New York Central and Hudson R.  
R., New York, being the Largest Belts in the World. We are now making an Elevator Belt 36  
inches wide and 2,500 feet in length, which will weigh over 18,000 pounds.

## LINEN and COTTON HOSE.

Plain and Rubber Lined.



Circular Woven-Seamless Antiseptic RUBBER  
LINED "CABLE" HOSE and "TEST"  
HOSE, Vulcanized Para Rubber and Carbolized Duck,  
for the use of Steam and Hand Fire Engines, Force  
Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.



"TEST" HOSE.

"CABLE" ANTISEPTIC

## Emery Wheels and Packing.

Patented.

ORIGINAL

Patented.



Solid Vulcanite  
EMERY WHEELS



Emery Wheel.

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED

Section of Emery  
Wheel showing  
Iron Center.

The properties of these Wheels are such that they can be used with great advantage and economy  
for cutting grinding, and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble,  
Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools,  
Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small  
Machinery of almost every description.

Pat. Jan. 16, 1866.

## PATENT ELASTIC Rubber Back Square Packing

Pat. Jan. 16, 1866.

BEST IN THE WORLD.

For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps  
B represents that part of the packing which, when in use, is in contact with the Piston rod.  
A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight  
and yet creates but little friction.  
This Packing is made in lengths of about 30 feet, and of all sizes from 1/4 to 2 inches square.

## Corrugated Rubber Mats and Matting,

Pat. 11,208, 215,601

For Halls, Flooring, Stone and  
Iron Stairways, &c.

Pat. July, 1879.



This practical and indispensable article—  
especially for wear where exposed  
to ice, snow or slush—was first intro-  
duced by this company several years  
ago, and its real value is in being  
almost indestructible, when  
proper materials are used in  
its manufacture, whilst the cheap



Inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle  
and crumbles to pieces. Address

## NEW YORK BELTING & PACKING CO.,

Warehouse, 37 and 38 Park Row, New York.

JOHN H. CHEEVER, Treasurer.

## TACKS & NAILS.

CUT TACKS, SHOE NAILS, WIRE NAILS,

Pat. Brads, Finishing Nails, Clout Nails, Trunk Nails, Hungarian Nails,  
Cigar-Box Nails, Basket Nails, 2d and 3d Fine Nails,  
Carpet Tacks, Upholsterers' Tacks, Gimp and Lace Tacks, Brush  
Tacks, Copper and Brass Tacks,

BRASS AND IRON ESCUTCHEON PINS, &c., &c.

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN, So. Abington Station, Mass.

New York Salesroom, 39 Warren St. Goods made to order from sample.

Particular attention given to orders for EXPORT.

## PHOSPHOR-BRONZE.

## The Phosphor-Bronze Smelting Co.,

Limited,

Owners of the

U. S.

TRADE



MARKS

Sole

Manufacturers

of

Phosphor

Bronze

in the

United States.

Bronze Patents. "Phosphor-Bronze."

Office and Salesroom,

512 Arch Street, - - - PHILADELPHIA, PA.

## THE STRONGEST, TOUGHEST,

BEST AND MOST DURABLE METAL.

PHOSPHOR BRONZE SPRING WIRE AND WIRE FOR WEAVING, &c.

Pump Rods, Tubes, Screws, Jack Chains,

Rolled Bolts, Nails, Wire Cloth, Sash Cords,

Sheets, Boat Nails, Pens, Wire Ropes,

Plates, Tacks, Sash Chains, Cast Kettles.

INGOTS FOR CASTING.

Send for Pamphlet and Price Lists.

## PHOSPHOR-BRONZE.

daily average of 13 tons of first quality of  
charcoal iron. Her present blast will close  
about the 25th of January. It is stated that  
this furnace will probably lie idle next  
season. Ore will be mined on the furnace lands  
and used in operating Hunnewell Furnace.  
Both are owned by the Eastern Kentucky  
Railway Company. Hunnewell Furnace  
will close her present blast during this or the  
coming week. The blast commenced on the  
10th of May last, and since that time the  
furnace has made 3870 tons of No. 1 char-  
coal iron, consuming in its manufacture  
651,800 bushels of charcoal, and 11,610 tons  
of iron ore, which is an average of 140 bush-  
els of charcoal and 3 tons of ore used for  
each ton of iron made. At the close of this  
blast the furnace will have on hand, for next  
season's operations, 1300 loads of charcoal  
and 2500 tons of iron ore.

### TENNESSEE.

The Roane Iron Works, of Chattanooga,  
have heavy orders on hand, and are working  
full capacity, night and day, to fill them.  
The Lookout Rolling Mill, Chattanooga, is  
running double turn.

### MICHIGAN.

The Iron Cliffs Company will bank up one  
of the Pioneer furnaces during the present  
week, to await an accumulation of coal, the  
continued open state of the winter rendering  
it impossible to keep up the supply. Thou-  
sands of cords of wood are cut, but cannot be  
moved to the kilns until there is settled cold  
weather.—Negaunee Herald.

We hear it authoritatively stated that it  
has been decided to take down the Grace  
Furnace at Marquette, the machinery having  
lately been disposed of.

### OHIO.

The Youngstown Register says: By the  
1st of January we shall have running in the  
very city itself one of the most promising  
coal banks that has been opened here for a  
long time. It is owned by the Witch-Hazel  
Mining Company, which is organized under  
the laws of Michigan, and of which Mr.  
Henry Wick is president, Mr. John M. Evans,  
treasurer, and Mr. C. B. Sill, secretary. A  
large proportion of the stock is owned by  
Mr. W. H. McCurdy, of Cleveland. The  
company has leased about 700 acres from  
Parmelee and Bissell, and coal has been found  
under all of it. At an early day the company  
will be mining from 100 to 300 tons daily.

The new locomotive works of the Ohio  
Central are secured for Bucyrus.

Monitor Furnace will blow in again in a  
few days.

Zanesville Furnace of the Ohio Iron Com-  
pany went into blast on December 20.  
We are informed that Emma Furnace, at  
Cleveland, has been purchased by a number  
of gentlemen, among them J. H. Daliba, of  
Cleveland; C. N. Schmick, of Leetonia, and  
Geo. D. Wick, of Youngstown. She will be  
put in blast by February 1. She has been  
idle some time in the hands of creditors.

The Standard Coal and Iron Company,  
with a capital of \$50,000,000, proposing to  
control a majority of the furnaces and mines  
in the Hocking Valley, will hold the first  
election in Boston next week and begin opera-  
tions with the new year. We hear they have  
already purchased 8 furnaces and 25,000  
acres of mineral lands, and secured options  
on many other interests.

The John H. McGowan Pump Company, of  
Cincinnati, write us that they have been  
exceedingly busy during the past year, that  
there has been a largely increased demand  
for their "Rival" steam pumps, and that  
for the coming year there is a large demand  
for their Letter "X" Rival, for portable and  
traction engine boilers, and that they have  
some large contracts on hand for their patent  
hydraulic presses and finishers for manufac-  
turing plug tobacco, one of which is from  
Australia. Their new factory is being  
equipped with new and most approved ma-  
chinery as fast as they can procure it from  
tool makers. The demand for pumps and  
machinery of their patterns is unprecedented,  
and their prospects for the next year are  
very good. With their new works they have  
a largely increased capacity, and they design  
keeping all the departments running full  
during the year.

The Hughes Cultivator Company, at Hamil-  
ton, have made arrangements for starting  
their works 1st of January, and will carry  
on the manufacture of their Magic hoes and  
articles formerly manufactured at their  
works. Ample machinery and tools have  
been provided, and they expect a heavy  
trade in the coming season.

The works of the Morris Sash Lock Com-  
pany, of Cincinnati, having proved too limited  
for the growing demand for their goods, the  
company have taken a permanent lease of  
the large building at Nos. 78, 80, 82 and 84  
Harrison street, and built a new foundry in  
connection therewith. They now have three  
stories of their large factory in full operation  
and will add another story to the building in  
the spring, and cover the entire lot with ad-  
ditional foundry and other buildings. They  
carry at the present time over 20,000 pounds of  
brass goods of their own make, to keep a full  
stock. They are getting out some new and  
beautiful designs of goods, which will appear  
in this year.

The Cincinnati Stamping Company, suc-  
cessors to the Sellow Mfg. Co., at Cincinnati,  
are now putting up a new and capacious  
building, which will be supplied with first-  
class machinery, and put into operation this  
year. This establishment has been for some  
time, owing to its connection with the old  
concern, doing only a limited amount of busi-  
ness, but Mr. A. Darusmont has assumed the  
management and control of the works,  
having purchased the entire interest of the  
old concern, and made arrangements for a  
vigorous prosecution of the work of stamping  
all kinds of metal goods, and will keep on  
hand a large and varied assortment of tin-  
ners and house-furnishing supplies. Their  
present office and salesroom are at No. 16  
West Pearl street.

The Cincinnati Steam Forge Company have  
been making some new and important ad-  
ditions to their works recently, and are at this  
time very busy on some heavy orders. The  
works, by the recent additions, are largely in-  
creased in their capacity, and will doubtless  
do a heavy business this year.

Some comparisons of the cost of the applica-  
tion of spirits, petroleum and illuminating

gas for heating operations in the laboratory  
have been made by Professor Wigner. The  
most costly material is spirit, which costs three  
times as much as petroleum or gas. Petro-  
leum and gas cost nearly the same, the for-  
mer being a little cheaper. The tests were  
made by noting the time and heating ma-  
terial consumed in raising the temperature of  
a given amount of water from 12° to 95°, the  
same vessel or vessels of the same shape and  
size being used in each case.

### Coal and Iron in Texas.

A recent issue of the *Tradesman*, in regard  
to the coal and iron deposits of Texas, says:  
As Texas has never yet had a geological  
survey, the extent of her coal strata is not  
well defined. It is supposed, however, to  
embrace about thirty thousand square miles,  
in the northern and western portions of the  
State. Over this great area coal has been  
found at a great many places, but at no place  
has it been mined except to a very small ex-  
tent. It is a bituminous coal, and almost, if  
not quite, precisely similar to the McAllister  
coal of the Indian Territory. Some anthra-  
cite has also been discovered in this coal ter-  
ritory. The railroads are now penetrating  
the coal formations of Texas, and this great  
source of wealth will soon, doubtless, be  
rapidly developed. So far it is a virgin field.  
In addition to the true coals of Texas there  
is an immense bed of lignite which extends  
apparently across the entire State from north-  
east to southwest, in the eocene formation.  
It is said to be at some points 20 feet thick.  
This lignite much resembles canal coal,  
and doubtless would be made quite equal  
to it by a process of pressure by machinery.  
It is very fat in various oils and gases.

Texas is peculiarly blessed with iron. In  
Eastern Texas there are immense deposits of  
hematite or brown oxide of iron. It runs  
through many counties, often forming high  
hills, which are literally filled with it. These  
ores contain from 40 to 75 per cent. of  
metal. In some places they are worked to  
some extent. The region in which these  
ores are located is heavily timbered, so  
that charcoal for reduction can be had at a  
nominal figure. The iron turned out is of  
excellent quality. In Robertson, Limestone  
and other counties of Central Texas the same  
quality of ores exist, and generally in close  
proximity to immense beds of lignite. But  
perhaps the grandest accumulations of iron  
ores in Texas, and probably anywhere else,  
are in Llano and Burnet counties. It is  
here in connection with primitive rock,  
and appears mostly as magnetite. It rises  
out of the granite in immense seams and  
dikes. It has been wrought to a small extent,  
and found to yield from 75 to 90 per cent.  
of metallic iron, equal to the best Swedish.  
There is plenty of timber for charcoal and  
limestone for flux. Besides, coal has been  
found near by, and it is known to be abun-  
dant a little further to the north. Soapstone  
is abundant in the same localities, valuable  
for furnaces.

### LABOR AND WAGES.

Some time ago the machinists in the em-  
ploy of the Reading Railroad Company in  
this city handed to Mr. Paxton a petition for  
an increase in their wages of 10 per cent., as  
everything in the way of living expenses is  
going up. This petition was sent to the com-  
pany's headquarters in Philadelphia. Mr.  
Wooten, upon being interviewed in this city  
on Saturday evening, could not say whether  
this advance, as asked for, would be granted,  
as he considered such a matter as coming  
strictly within the jurisdiction of the private  
affairs of the company, but that if favorable  
action were taken, the employees would be  
promptly notified.—Reading Times.

The Top Mill hot-iron feeders met at the  
Second Ward Market House last evening  
with a full attendance. It was resolved to  
resume their places in the mill this morning,  
the learning boys having been taken off yester-  
day, and everything arranged satisfactorily  
to the hot feeders. This action is taken  
by the cold feeders as an encouraging sign  
for them.—Wheeling Intelligencer, Dec. 28.

The long-standing dispute which breaks  
out periodically between the Waverly Coal  
Company, Pittsburgh, on one side, and the  
president of the Miners' Union and the  
*Labor Tribune* on the other side, has culmi-  
nated in the filing of the preliminary papers in  
a libel suit for damages, the amount of  
which is not set forth. The plaintiff is the  
Waverly Coal Company. The defendants  
are Thomas A. Armstrong and Thomas Tel-  
ford, proprietors of the *Labor Tribune*, and  
D. R. Jones. They are charged with the  
publication of articles containing false and  
malicious statements respecting the Waverly  
Coal Company, and with misrepresenting the  
manner in which the plaintiff company treat  
their employees. They charge that these  
articles set forth that they treated their em-  
ployees badly, in not providing decent and  
comfortable houses for them to live in, and  
that they submitted them to a serf-like bond-  
age, and urged miners not to work for them;  
also advised those to leave who were work-  
ing, even going so far as to form encamp-  
ments in the vicinity for the purpose of in-  
ducing their men to leave. The owners of  
the *Labor Tribune* are reported as saying  
that they cannot see where the action for  
libel comes in, as all the articles published  
were items of news. The paper is published  
in the interest of workmen, and they will  
always publish and show up corporations or  
anything else that opposes the interests of  
the laborer. As regards the Waverly mines,  
they are the only ones that are not in the  
organization, and other operators were com-  
plaining that, while they complied with the  
demands of the union, Secretary Jones al-  
lowed the Waverly Company to undersell  
and do as they pleased.

The Commissary-General of Immigration  
who has been sent to Europe by the Govern-  
ment of the Argentine Republic, announces  
that immense numbers of farmers from  
Belgium and Germany are preparing to  
leave for that country. The steamship lines  
from Genoa, we also notice, have nearly  
doubled their service, and leave with from  
800 to 1200 emigrants every trip.



# The Iron Age

AND

## Metallurgical Review.

New York, Thursday, January 5, 1882.

DAVID WILLIAMS, Publisher and Proprietor.  
JAMES C. BAYLES, Editor.  
JOHN S. KING, Business Manager.

### RATES OF SUBSCRIPTION INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

Weekly Edition.....\$4.50 a year.  
Issued every Thursday morning.

Semi-Monthly Edition.....\$2.30 a year.  
Issued the First and Third Thursday of every month.

Monthly Edition.....\$1.15 a year.  
Issued the First Thursday of every month.

TO ALL OTHER COUNTRIES.  
PER ANNUM, POSTPAID.

Weekly Edition: \$5.00—£1—35 francs—30 marks—12 florins—6 roubles (coin)—25 lire—20 pesetas.

Semi-Monthly Edition: \$2.50—10/6—12½ francs—10 marks—6 florins—5 roubles (coin)—12½ lire—10 pesetas.

Monthly Edition: \$1.25—5/3—6¼ francs—5 marks—3 florins—3 roubles (coin)—6¼ lire—5 pesetas.

REMITTANCES should be made by draft, payable to the order of David Williams, on any banking house in the United States or Europe; or, when a draft cannot be obtained, in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; the Wilmer & Rogers News Company, New York, U. S. A.; and London, England; or the San Francisco News Co., San Francisco, California, U. S. A.

RATES OF ADVERTISING. One square (12 lines, one inch), one insertion, \$2.50; one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$45.00; payable in advance.

DAVID WILLIAMS, Publisher, 83 Rensselaer Street, New York.

PITTSBURGH: Jos. D. Wenzel, Manager and Associate Editor.

PHILADELPHIA: 270 South Fourth Street, Thos. Hobson, Manager.

CHICAGO: 35 & 38 Clark st., cor. Lake, Henry Smith, Manager.

CINCINNATI: Builders' Exchange, T. T. Moore, Manager.

CHATTANOOGA: Eighth and Market Streets, S. R. Lowe, Manager.

BRITISH AGENCY. The publishers of *The Iron Age*, 114 Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

### CONTENTS.

- First Page.—The Cowper Hot Blast Stove. Magazines for Explosives. National Board of Trade. The United States Torpedo Service.
- Third Page.—Annual Review of the Metal Market for 1881.
- Fifth Page.—Annual Review of the Metal Market for 1881 (Continued).
- Seventh Page.—Annual Review of the Metal Market for 1881 (Continued).
- Ninth Page.—Annual Review of the Metal Market for 1881 (Continued).
- Eleventh Page.—Annual Review of the Metal Market for 1881 (Continued). Industrial Items.
- Thirteenth Page.—Industrial Items (Continued). Coal and Iron in Texas. Labor and Wages.
- Fourteenth Page.—Progress in Spanish America. The Continental Iron Markets. The Outlook for Iron in the West. The Atlanta Exhibition. American vs. English Steel.
- Fifteenth Page.—American vs. English Steel (Continued). Rail Inspection. Proposed Removal of Diston's Saw Works. Iron Ore Imports Since July 1, 1878. Washington Notes. An Improved Ratchet Screw Driver. Locomotive Engineers. Gilding Steel.
- Sixteenth Page.—British Iron, Steel and Hardware in 1881. The Duration of English Iron Ores.
- Nineteenth Page.—The Duration of English Iron Ores (Continued). Covering Boilers with Silk. Inter-State Commerce. Prevention of Overwinding.
- Twentieth Page.—Coke and Coke Crushing.
- Twenty-first Page.—Trade Report. General Hardware.
- Twenty-second Page.—British Iron and Metal Markets. Iron. Metals. Coal. Foreign Trade Movements.
- Twenty-third Page.—Foreign Trade Movements (Continued). Exports. Imports. Old Metals. Paper Stock, &c. Philadelphia.
- Twenty-fourth Page.—Philadelphia (Continued). Pittsburgh. Chicago. Chattanooga. Boston. Louisville. Cincinnati. Baltimore. Our English Letter.
- Twenty-fifth Page.—Our English Letter (Continued). Foreign. Double-Action Clutch Screw Driver. Scientific and Technical.
- Twenty-sixth Page.—Ericsson's Latest Invention. How Lost Cars are Traced.
- Twenty-seventh Page.—The Iron Age Directory.
- Twenty-eighth Page.—New York Wholesale Prices.
- Twenty-ninth Page.—New York Wholesale Prices (Continued).
- Thirtieth Page.—New York Wholesale Prices (Continued).
- Forty-fifth Page.—Philadelphia and Pittsburgh Hardware and Metal Prices.
- Forty-sixth Page.—Boston Hardware and Metal Prices.

The Socialistic Labor Party, at its recent meeting in New York, declared against a protective tariff. This is the latest and strongest argument we have seen in favor of such a tariff. It used to be a maxim of Napoleon to find out if possible just what the enemy did not want him to do, and then do it. Having found out what this enemy of all law and order does not want done, we suggest that it is good policy to do it. That argument against protection is that when wages are increased through the protective tariff, expenses are equally increased, and that when free trade lowers the cost of liv-

ing, wages are also lowered; therefore the resolutions declare the tariff question in no way affects the true interests of the laboring population of the country, being a question of more interest to employers and used by them as an instrument to draw the working people into the old parties. We commend these sentiments to the workmen, who know that their wages have been raised by the tariff, so that to-day they are getting fully double what their fellows abroad are getting, and at the same time the price of a barrel of flour or a pound of meat is less here than in Europe.

### Progress in Spanish America.

Business prospects in Spanish America and Brazil for the current year are promising, crop accounts being, on the whole, favorable, and, with few exceptions, the political horizon cloudless. The Mexican Congress has just adjourned, after endorsing all the railroad concessions, with or without subsidies, the new National Bank schemes and proposed nickel coinage project. Mexico's frontier disputes with Guatemala were at one time quite threatening, but there is now a well-founded hope that they will be settled without a resort to arms. The remaining four Central American republics are getting on without internal and external trouble. The coffee and indigo crops are ample, the latter bringing high prices. In Cuba the sugar crop will be about 15 per cent. larger than that of last year. The new Captain-General, Prondergast, it is expected, will prove as good an administrator of finances, &c., as his predecessor, General Blanco. The other West India Islands report good crops and are getting on quietly, except St. Domingo and Hayti, where revolutions have broken out again.

Colombia is doing well in point of material progress. President Nufez seems to be popular. The Congress of Spanish-American Republics, to come off at Panama, has proved a failure, only two or three responding to the call. It was hoped there to constitute the basis for arbitration among them and frame a common law to that effect, but the idea is generally regarded as premature, or, at any rate, ill-timed. President Guzman Blanco, of Venezuela, wants his Legislature to raise an army for the quelling of a revolution which he believes impending, but that body shows little inclination to increase his power. Under his iron rule the country, meanwhile, fairly progresses, and crops fulfill expectations. In Brazil the elections under the new franchise have been unaccompanied by troubles. Railroad building is going on most actively. The coffee crop has been unusually large, 5,000,000 bags, but the coming one is reported damaged by drought during the blooming season in the two most productive provinces. A report says the sugar crop leads to some disappointment. On the whole, however, the Empire is in a flourishing condition. American machinery for sugar grinding and boiling has been officially declared quite recently in Brazil to be superior to European. In Uruguay revolution has been warded off, and the disturber of the peace, ex-President Colonel Latorre, had withdrawn to Buenos Ayres, whence he was expected to leave for Europe. Business may now look up at Montevideo. The Argentine Republic is at present the most prosperous country in South America. President Roca, through the good offices of the United States, has succeeded in making an acceptable treaty with Chili in the Patagonian frontier dispute. All internal difficulties have been smoothed down through his energy and tact, while the finances have taken such a favorable turn that paper money is about to make room for the gold standard, and capital and immigration flow into the country faster than ever. The machinery exhibition at Buenos Ayres in February next may prove a success. Railroad building is most active in the republic, and so is judicious settlement in the agricultural regions.

Chili, although otherwise progressing almost as well as ever so far as its material interests are concerned, has still to confront the difficult problem of making some peace settlement with Peru which shall indemnify the former in some tangible manner for the sacrifices involved by the war. Fortunately, the American envoys sent out quite recently are believed to be men of sufficient experience and ability to assist Chili with as much success as attended our mediation between Chili and the Argentine Republic, above referred to. Chili will not unlikely be glad to make some equitable arrangement not too severe upon the vanquished State, but yet leaving unimpaired her honor and just claims of some indemnity, or security for such. Mr. Trescott's task will, in any event, not be an easy one. With the re-establishment of peace, Chilean copper production may soon be restored to what it was at the outbreak of the war. From Peru, the instigator of all the trouble, Ex-Dictator Piérola has at length, the cable tells us, withdrawn for safer quarters, and as the provisional President, Calderon, has been sent out of the country to Chili, the field seems to be clear for some stable government under the supervision of Commander Lynch. Meanwhile the country is being ruined outside of the Chilean lines by roving bands of marauders. It is, indeed, high time that this intolerable state of things should terminate. The Bolivians, from their mountain fastnesses, seem to look on complacently. News from Chili will be looked forward to in the United States with great

interest, for more than one reason. Taking a step further north on the West Coast, we find Ecuador, under the management of President Ventimilla, very prosperous in view of a fair cocoa crop. The general aspect in South America, it will be seen from our rough sketch, is an encouraging one, holding out good prospects for our business relations with that part of the New World, to improve which we hope the new year may materially contribute.

### The Continental Iron Markets.

The condition of the German iron market continues very strong. Common pig iron, as well as Bessemer pig, is in great demand, and it is expected that several furnaces out of blast at present will be blown in shortly. Pig iron shows a rapid increase in value, and this is causing some inconvenience to the producers of finished iron, who have not been able to raise their quotations in proportion. Steel rails and railway materials in general are much sought after. The State Railway authorities have given out orders at Cologne for a large tonnage of steel rails, of which Bochum will supply 6200 tons, at \$40 per ton, and the Rhine Steel Company, 970 tons, also at \$40. The Phoenix Company at Laar will furnish 3600 steel sleepers, at about \$36 per ton. In France the demand for all kinds of iron continues very strong, and the effect of the advance on coke is now being made apparent in the value of pig iron, which has gone up. Merchant iron remains firm. *Le Fer* says that the prices are very firm at Paris, with a tendency toward advance. Building operations are fairly well carried on, as the weather has not yet been so inclement as to stop them materially. The principal Parisian constructors do not hesitate about giving out large orders to the forges, in spite of the higher prices and the approaching conclusion of various commercial treaties. The new law relative to the merchant marine has induced those houses who are connected with naval construction to decide upon increasing the extent of their establishments, and other yards will be started. In the Nord district, 190 francs is now a low figure for merchant iron, and 192.50 francs, and even 195 francs, is paid. In the Haute-Marne an order for 250 tons of pipes for the city of Paris has been given to the Bayard Foundry. The railway companies are buying more freely from the iron founders, while for iron manufacturers the position and prospects of the trade are excellent. The Société Braconier are to erect a steel manufactory at Pagny-sur-Meuse. The Dronville Company have become the purchasers of the Liverdon forges, the sum to be paid being 635,000 francs. In the Ardennes the demand for malleable iron is somewhat quieter, but pig iron is in excellent request, and the foundries are offered considerably more work than they can undertake. The mills in the Loire and Centre have a full supply of orders. At the Saint Etienne Steel Works a new Pernot furnace is to be put in operation, and this differs from the usual furnaces of this kind in that the gas producers communicate direct with the furnace, instead of having the intermediary of a tube. On the same principle a Siemens-Martin furnace is to be erected, and a new plate train is also to be laid down. At Givors, Harel & Co. are about to apply the Cowper apparatus to their furnaces. At the Baucarre Works, near Nismes, two furnaces have been set to work, and the third blast furnace will be ready in March or April. Two large Siemens-Martin furnaces are to be erected there.

It appears that the Thomas-Gilchrist process is not proving acceptable in France. Recently the Paris, Lyons and Mediterranean Railway Company gave an order for 200,000 tons of rails, with the express condition that no dephosphorized rails should be supplied, but ordinary Bessemer rails only. More recently, this company agreed to take a trial lot of 500 tons of dephosphorized rails from the Creusot Works, and these were laid down along various sections. It is considered to be yet too early to form a satisfactory opinion on the subject, but it is reported that the engineers of the railway in question say freely that the new-process rails split and wear away much more rapidly than the old Bessemer rails. The French ironmasters have not yet made provision for adopting the new process, and it is probable that the true reason of the agitation against the dephosphorized rails will be found in this fact. Preparations have, however, been recently commenced by the Société des Forges, of St. Nazaire, to introduce the process, and it is not unlikely that the example will soon be followed in different parts of the country.

The Wiener Zeitung gives a glowing account of the state of the Austrian iron trade. Merchant iron, girders and sheets are in great demand, while the stove-casting trade is growing very rapidly. In railway material the works have almost more than they can do; rails, fittings, rolling stock, wheels, tires, axles, springs, &c., are occupying the whole energy of the establishments devoted to their production. The *Montan Zeitung* gives the following list of orders already given out for execution in 1882: Staatsseisenbahn Gesellschaft, 45 tender locomotives for the Austrian Midland Railway, 10 tender locomotives for the Western Railway, and 10 freight locomotives for the Austrian Railway; the Florisdorf Locomotive Works have orders for 60 tender locomotives for the Paris-Lyons-Mediterranean Railway, 60 for the Suedbahn, and 10 for the Nordbahn; the Vienna-Nau-

stadt Works have 80 for the Paris-Lyons-Mediterranean, 50 for the Western Railway, 10 for the Midland, 20 for the Eastern, 10 for the Orleans, and 20 for Austrian railways. The Simmering Works have orders for 14 passenger carriages for Austrian railways, 80 covered wagons for the Northwestern Railway, and 10 petroleum wagons for the same company; the Ringhoffer Works will supply 100 covered wagons to the Northwestern Railway, 300 coal cars to the Prag-Duxer Bahn, 300 coal cars to the Bohemian railways, 25 carriages and brake vans to the Suedbahn, and 10 beer wagons to the same company; the Hernalser Works, 31 passenger carriages for the Northwest Company, 80 covered wagons for the Elizabeth Company, and 14 various wagons for the same company; the Ganz Works have orders for 81 passenger carriages and 300 freight cars for Hungary, 140 wagons for the Kaschau-Oderberger Railway, and 40 for Serbian railways.

### The Outlook for Iron in the West.

The close of the year finds the market in the West for iron in its various forms in a most peculiar condition. In some respects the year just ended has been one of great prosperity. The volume of business has never been equaled. The center of the iron trade, both in production and consumption, is moving steadily westward, and the demand upon the ore banks, the coal fields, the blast furnaces, the rolling mills and the steel works of the section west of the Alleghenies, has led to an unprecedented production and a marked increase in the capacity for production. The East has experienced a somewhat similar state of affairs, but not to the marked degree that it has been manifest in the West. This demand has been a continuous one. Times and seasons have not affected it, and the only drawbacks have been the difficulty in running the mills consequent upon the extreme heat and drought of the summer and the freight blockade of the latter half of the year. But as the new year comes in the question of an advance meets them, which their good sense advises them not to make, and which it seems well-nigh impossible not to make. Buyers seem determined to advance the rates on finished iron. We do not mean that they deliberately set to work to do this, but their action in many cases as surely tends to this as if they had held a meeting and resolved to pay 1/4 cent more. They desire to contract ahead, and, finding a disposition adverse to such contracts on the part of manufacturers, try to accomplish their point by offering an advance. A careful review of the situation and the outlook may help our readers to form a judgment as to the future.

First, as to ore, although the output of ore in the West has been largely increased, the Lake Superior region alone showing an increase of nearly 400,000 tons, all of the first-class Bessemer ores seem sold up. This affects not only Bessemer pig, but forge pig and bar iron. Ore for settling that two months ago was offered at \$3 to \$3.50 at Cleveland, is now scarce at \$9.50. Foreign ores, of which considerable is used near Pittsburgh, have advanced considerably, owing to the advance in freights. Whether there is any immediate relief will depend upon the time of opening navigation on the lakes and the demand for grain from Europe. If navigation opens early and grain moves freely to Europe, supplies of lake ores may be abundant and freights fall on foreign ores. The prospect of either of these reliefs does not look bright as we write. In pig the stocks are well-nigh exhausted. In the West so many furnaces have banked, owing to a short supply of coke, that the make of the past few months has been very much reduced and old stocks drawn upon. Bessemer pig especially seems in very great demand, and it is quite improbable that the output can be materially increased for some months, owing to the reasons given above concerning ore.

The price of muck bar, as compared with that of bar iron, is an anomaly. Good first-class muck bar has sold in Pittsburgh at \$46. This same bar sold three months ago at \$40. Now, muck bar at \$46 is about 2.3 cents a pound for iron, and, say, four-tenths a pound for putting it into bar, would make 2.7 cents for iron. It should be stated, however, in fairness that this bar is not made into common bar, but into extras, so that even at a 2.5 cent card it might pay to use small quantities of muck at this price in extras. In merchant iron the card is and has been for some months 2.5 cents, and, as stated above, at this rate the mills have all they can do, with a constant pressure on the part of buyers to place orders ahead. There is no doubt that manufacturers are getting the full card for all that is sold at present, and it is even rumored that some sales have been made above the card. Of this, however, we have seen no proof. The workmen are becoming uneasy, and are suggesting advances. However, it can be said that the best manufacturers West are opposed to any advance, and if it is made it will be against their advice. The nail market is in the same condition as the bar iron market. There has never been a time when, relatively to the production, the stocks were as small as at present. Even the buyers concede that an advance could be maintained, and, if any should be made in bar iron, one will undoubtedly be made in nails. If the present price of pig is maintained, both nails and bar must advance, and if the price at the East remains as it is, and goes no higher,

this would be an argument for an advance. Before this reaches our readers, however, the Western Iron Association will have met, and the question to advance or not will have been decided.

### The Atlanta Exhibition.

The exhibition which closed with the end of the year at Atlanta, though limited in scope and not possessing the measure of general interest which attaches to exhibitions more varied in character, seems to have accomplished a very important work, and those with best opportunities for judging believe that its influence for good will be immediate and permanent. It has brought together thousands of representative Northern and Southern men, and created a cordial feeling between them, which will do much to abolish sectional prejudices. It has given the Southern planters an opportunity to examine the newest and most approved machinery and implements applicable in farming operations, and the extent to which these have been appreciated is shown by the fact that large sales are reported by exhibitors. Trade thus created by purchases for use, will unquestionably grow to important proportions if properly encouraged. Another important benefit to the South will undoubtedly result from the visit of Northern capitalists to the South, in showing them many opportunities of profitable investment in undertakings which the Southern people cannot well attempt, from lack of capital and experience. The South is an inviting field for enterprise. It is rich in resources and favored by nature in many ways. It is not an El Dorado, where fortunes can be reaped where no man has planted, but it is a country where a thousand dollars is worth more, and can be made more productive, if judiciously invested, than in any other part of the United States where it would be likely to seek employment. The opportunities in connection with cotton spinning and the manufacture of certain grades of cotton cloth, are very tempting, and we have no doubt they will be availed of to an extent which could not have been hoped for had this exhibition not been held.

But a still larger and more permanent benefit will be found to have resulted in stimulating the Southern people to a better appreciation of the profits and benefits of diversified industry. Already a great many are asking, Why cannot we have a mill, or a forge, or a foundry, or a manufactory of some sort in our town, to develop our resources and bring population? This question they are in many cases likely to answer for themselves in a very practical way, by raising the necessary capital and starting manufacturing on a small scale. They have seen with surprise and benefit the fruits of Northern enterprise, and have begun to realize that protection is not for one section, but for all, and that if the South has not had her share of its advantages, it is because she has neglected her opportunities and devoted her energies almost exclusively to agriculture. During the past few months there has been a great change in the sentiment of the Southern people on this important question. Zealous converts to the cause of protection are plenty, and they are making themselves heard through the newspaper press with a distinctness which would have astounded their predecessors of the last generation. The spectacle of the South "solid" for protection, would be gratifying indeed, and considering everything—the political as well as the economic aspects of the question—it would not be at all extravagant to predict such a thing. Meanwhile we shall look for the immediate results of the Atlanta Exhibition in a marked improvement in the cultivation and handling of the cotton crops, and in increased manufacturing consumption of this important staple.

### American vs. English Steel.

A late issue of the *New York Times* has the following in the course of an editorial: "It would be particularly unwise to build 'American men-of-war of American steel,' for, however good our iron may be, we have not yet been able to produce steel that is at all equal to English steel, and Mr. Vanderbilt prefers to import steel rails for 'his road at a very much higher price than he would have to pay for home-made protected steel.' The utter absurdity of the first part of this extract, which advises against the use of American steel plates, is patent to every one who knows even cursorily the history of the manufacture and use of steel plates for the hulls of vessels and for boilers. It was in this country and at Pittsburgh that steel plates were first successfully manufactured and used, years before they could be made sufficiently low in carbon in England to be used. It is not eight years since we editorially combated the position of the *London Engineer*, we think it was, that steel was not successfully used for plates. It is less than this period that some eminent engineer argued against steel plates before some one of the scientific societies of England, and his argument was received with almost universal approval. American steel plates are better than English ever were. Our manufacturers have had a longer and more successful experience in manufacturing them than have the English.

Now about the last part, that "Mr. Vanderbilt prefers to import steel rails for his 'roads.' If the intention of this is to argue that, therefore, English steel plates are the best, it does not follow by any means, as the steel in rails and in plates is not the same,



If the intention is to say that foreign steel rails are better than any American rails, we can only say that Mr. Vanderbilt will not say so. We know that there is in the office of the New York Central Railroad the record of certain tests that show conclusively that certain American rails are better than any English rails ever laid down on that road. We know Mr. Vanderbilt has bought largely abroad, but it may be possible that it has not been because the foreign rails were the best. It may be just barely possible that he delayed buying until certain brands that he wanted, and which had been offered him, were sold up. A correspondent answers the New York Times in effect as follows: "Mr. Vanderbilt will tell you to-day that, after several years of 'thorough test upon the New York Central' main line, he has found an American steel rail which does not suffer in comparison with his recent purchases of the foreign article, and that he has consequently contracted for this domestic steel rail for his 'wants during next year to the extent of' 'nearly 20,000 tons.' And yet certain newspapers reiterate this statement, that Mr. Vanderbilt prefers to import steel rails at a higher price than he can get them made in this country."

We learn with pleasure that the Senate Committee on Claims has favorably reported the bill making an appropriation to satisfy the claim of Mr. A. H. Emery, of this city, for the design and construction of the great testing machine now at the Watertown Arsenal. An appropriation was made to cover the estimated cost, but the real cost, with attendant expenses to the builder, was much greater than the amount appropriated. Mr. Emery has received \$31,500, and has a claim for \$129,000 for disbursements and expenses. It is the duty of the Government to recognize and pay for professional work duly ordered, especially when it is honestly and intelligently performed, and the results are entirely satisfactory, as Mr. Emery's testing machine certainly is. The bill reported by the committee appropriates \$225,000 as compensation to Mr. Emery for his work. It will be worth this to the country many times over, if the work of testing materials is committed to such a commission as that which began its work by giving Mr. Emery an order for this great machine. As used at present, it is not likely to be of any great value to anybody.

A suit of unusual interest and importance, affecting the relation of manufacturers to railroads when the latter refuse to extend to the former the advantages promised as an inducement to build works and establish business along the latter's lines, has been brought by the National Tube Works, of McKeesport, Pa., against the Baltimore and Ohio Railroad, damages being laid at \$1966.42, with interest from 1878. The allegations are that the plaintiffs located their works at McKeesport in consideration of an agreement with the Pittsburgh and Connellsville Railroad that, for the purpose of freight charges to eastern points (including Boston), McKeesport should be considered a competitive point, and that plaintiff should not be charged for such shipments any higher rates than those from Pittsburgh; that the defendants have recognized this agreement since 1877; that the plaintiffs erected large works at McKeesport and shipped by way of defendants' road to Boston its merchandise, and have been required to pay therefor additional freight to that agreed upon under the head of "wharfage," and defendants refused to deliver the merchandise until the sums were paid. Upon the above showing this suit was instituted.

Elsewhere in this issue we publish a valuable table, compiled for us by Mr. Joseph Nimmo, Chief of the Bureau of Statistics, showing the importation of iron ores into the United States during the fiscal years 1879, 1880 and 1881, and for the four months ended with October last. From an importation of 150,800 tons in 1878-9, valued at \$343,034, it increased to 621,073 tons in 1881, valued at \$1,723,885. The details are interesting as showing the relative importance of the several sources of foreign supply.

The business embarrassments reported during 1880 have been few and relatively unimportant in New York in the trades especially addressed by us. Five hardware houses have failed, with aggregate assets valued at \$50,320, and liabilities to the amount of \$165,508. In the iron and metal trades there have been but two failures, with liabilities aggregating \$175,153, and assets worth \$40,988. This is not a bad showing. The total number of failures in New York was 391; the total liabilities reported, \$11,130,933, and assets valued at \$3,902,096.

We print elsewhere the first installment of our annual reviews of the iron and metal trades. These reviews are compiled with much care, and are of the greatest statistical interest and value. The commercial history of a year is full of instruction to the manufacturer or merchant who will study it carefully.

Mr. Joshua Rose, in a recent issue of the *Mechanical Engineer*, says: "Sometimes a circular saw that has just been tempered and laid down to cool will commence to hum, and if it is not quickly replaced in the furnace it will crack. The humming begins in a low musical key, and rises in tone until it ends in a snap. The saw does not always crack

through from the eye to the perimeter, and it never does so if it is got into the furnace while humming in a low tone. If the crack proceeds but a part of the way, it is from the bottom of a tooth or space and toward the eye. Saw makers are unable to explain the causes of this singular fact, which is a very costly one to them."

#### Rail Inspection.

LONDON, 3d Nov., 1881.  
Offices: 19 Gt. George St., Westminster, S. W., and at Essen, Germany.

To the Editor of *The Iron Age*, New York.—Inasmuch as some recent offers have been made to me to inspect blooms for steel rails, on the conditions that the maker should pay the cost of inspection, both chemically and mechanically, I feel it my duty to explain why such method of payment would be unsatisfactory and improper.

The first principle of all inspection should be to place the inspector on an independent footing. This he cannot be if he is under the pay of the party whom he is going to control. I need hardly say that I can only undertake bloom inspection on the same principle as I am doing rail inspection, that the fee shall be paid by the buyer, and not by the maker. Yours truly,

C. P. SANDBERG,  
Inspector to the Swedish Government and other railways.

#### SANDBERG'S SPECIFICATION FOR STEEL BLOOMS FOR RAILS AS WORKED IN 1881.

##### Time of Delivery.

##### Dimensions.

##### Weight.

Marking.—Each bloom to be marked with the maker's name, either rolled on the sides or stamped in plain letters at the end, and also to have inspector's stamp after approval.

Mode of Manufacture.—The steel must be cast into ingots large enough to work down into at least two blooms of dimensions required. The ingots must be heated, hammered or rolled, as specified to clean blooms, ends cut square and perfectly solid, and the surface to be free from cracks or flaws.

Inspection Mechanically.—Previous to the charge being used, a small sample ingot to be tested from every blow by forging and bending cold to right angles.

The blooms will be passed in lots not exceeding 250 tons each. The inspector appointed by the buyer will select from each lot a certain number of blooms, not exceeding 1 per cent., to be rolled into rails of any sections at hand at the moment. Such rails must be free from cracks, flaws and other imperfections, and the cross-ends sustain Sandberg's normal drop test without fracture.

Inspection Chemically.—The steel must be analyzed for carbon by makers to show that it contains the stipulated amounts of from 0.20 to 0.40 per cent., and the inspector has the right to see that this is carried out, and also to take borings to check these analyses. Besides the carbon testing, the inspector may take borings from any blooms or rails he chooses for general analysis, which must agree with buyer's stipulations for the contents of sulphur, phosphorus, silicon and manganese, but if there be no such stipulation, the inspector will have to satisfy himself that the steel is of proper chemical composition, and suitable for making steel rails of first quality. Part of such borings may be handed over to the works chemist to compare results with the inspector if desired.

The inspector or his assistants are to have the right of entrance into the works at all times, to inspect the manufacture and quality of material, and to superintend the testing as well as to inspect the blooms.

Inspection Certificates.—The inspector shall issue certificates of blooms inspected both mechanically and chemically, when requested, for any portion of the order passed, to state that the blooms are practically within the limits of the specification, and in his opinion suitable for making steel rail of first quality.

Note.—Exporters of blooms and rails may be at liberty to adopt the Sandberg specification, but unless he himself is entrusted with the inspection both mechanically and chemically, he cannot be responsible for the results. An inspection book showing that this specification has been executed both mechanically and chemically shall be handed to the buyer, who shall then pay the inspection fee, which on no account is to be paid by the maker.

**Proposed Removal of Disston's Saw Works.**—The Philadelphia Record says: Before another year rolls around there will be little left of the great Disston Saw Works at Front and Laurel streets. Since the founder of the house, the late Henry Disston, purchased a tract of land at Tacony, in the Twenty-third ward, and removed the file department of the works thither, the firm have been working with the intention of ultimately transferring the entire establishment to the country site. The Disstons soon reaped the advantages of the change in respect to the file manufacture, which was made five years ago. The business which was done in the narrow quarters of the Sixteenth ward works developed rapidly, until the present production of files is 700 dozens per day. The woodwork department was the next to go to Tacony, and in its wake, at a period not very remote, went the long saw branch of the concern. This leaves at the Front and Laurel streets works the circular saw and short saw departments, and during the present year additional buildings are to be erected at Tacony for the making of the circular saws. When the Disstons came to arrange for the erection of the new structures, they found that in order to provide ample accommodations for their business and its prospective gradual increase it would be necessary to purchase more land. Negotiations were opened with the heirs of the Green estate for 85 acres of land adjoining the Disston possessions, which already embraced 160 acres. The matter hung fire for some little time, but a bargain was finally struck by the Disstons paying the sum of \$100,000 for the Green property. Building operations will begin in the spring and be rapidly prosecuted

#### IRON ORE IMPORTATIONS SINCE JULY 1, 1878.

The Chief of the Bureau of Statistics has prepared for *The Iron Age* the following valuable statement of the quantities and values of Iron Ore imported into the United States, by countries, during the years ended June 30, 1879, 1880 and 1881, and the four months ended October 31, 1881:

Countries.	1879.		1880.		1881.		Four months ended Oct. 31, 1881.	
	Tons.	Dollars.	Tons.	Dollars.	Tons.	Dollars.	Tons.	Dollars.
Brazil.....	.....	.....	.....	.....	1,022	2,507	.....	.....
Denmark.....	.....	.....	.....	.....	2,020	3,594	.....	.....
France.....	890	1,940	10,277	26,865	23,289	48,645	22,363	55,885
French West Indies.....	200	461	.....	.....	.....	.....	.....	.....
French Possessions in Africa and adjacent islands.....	31,727	88,159	113,222	336,758	111,345	348,280	82,696	233,925
Germany.....	.....	.....	.....	.....	5,107	12,406	1,034	17,933
England.....	18,828	54,789	79,319	285,313	64,228	260,356	32,697	122,014
Scotland.....	353	787	6	21	2,526	11,653	.....	.....
Ireland.....	5,867	12,958	12,164	29,073	10,640	27,378	7,452	17,175
Gibraltar.....	.....	.....	.....	.....	3,250	10,271	.....	.....
Nova Scotia, New Brunswick and Prince Edward Island.....	.....	.....	.....	.....	.....	.....	5	37
Quebec, Ontario, Manitoba and the Northwest Territory.....	3,904	8,943	29,297	79,386	43,177	131,188	21,926	72,046
British Columbia.....	.....	.....	.....	.....	1,000	1,030	400	798
British Possessions in Africa and adjacent islands.....	.....	.....	.....	.....	.....	.....	710	2,897
British Possessions, all other.....	.....	.....	.....	.....	.....	.....	.....	.....
Italy.....	9,008	20,786	33,755	88,928	65,229	179,433	43,681	132,707
Portugal.....	.....	.....	8,234	22,621	10,369	23,713	9,995	27,420
Russia on the Baltic and White Seas.....	.....	.....	.....	.....	.....	.....	799	25,557
Spain.....	80,044	154,211	134,807	314,074	263,575	604,790	125,093	270,060
Spanish Possessions in Africa and adjacent islands.....	.....	.....	.....	.....	2,500	7,616	.....	.....
Turkey in Asia.....	.....	.....	.....	.....	1,065	26,961	1,622	39,065
Turkey in Africa.....	.....	.....	1,800	3,917	10,641	23,764	.....	.....
United States of Colombia.....	.....	.....	1,000	2,593	.....	.....	.....	.....
Uruguay.....	.....	.....	.....	.....	.....	.....	505	1,790
Venezuela.....	.....	.....	209	517	.....	.....	.....	.....
Total.....	150,821	343,034	425,012	1,192,961	621,073	1,723,885	351,704	1,019,792

The returns for a later period than October 31 have not yet been collated, but seem to indicate that the importation and use of Foreign Ores during the present year will exceed anything ever known in the history of the Iron trade of the United States.

to completion. The short saw department, which is an important element of the works, will be continued in the city, but the time will not be long before the great manufacturing interest will disappear from the precincts of the Sixteenth ward, a change which will materially affect a considerable portion of the population of that vicinity.

#### WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., Jan. 4, 1882

The Secretary of the Treasury has been in receipt of a number of letters from importers of steel blooms, urging him to hasten the decision of the controversy growing out of the assessment of certain importations at the specific rate, instead of at the ad valorem rate, as claimed by the importers. It was expected that the decision would have been reached to-day, but the press of public business was such that the Secretary could not give the matter his attention. He says, however, that he will certainly dispose of the question during the present week. The case has already been made up ready for his consideration. This includes the arguments on both sides and the Collector's rulings. It was observed in official quarters that it was a question which could be very easily settled. This being the fact, the inference would be that the decision would be favorable to the interests of the manufacturer, as any other decision would interminably complicate matters and lead to future embarrassment. Owing to the use of new commercial terms, especially in articles of steel, growing out of recent inventions in that metal, the customs laws are behind the age, but it is the policy of the department, as far as possible, to adhere to the general spirit of the statutes, and not to be disconcerted by quibbles in matters of terms.

A very amusing incident occurred a few days ago in which this question appeared, and of which the Secretary tells. It appears that the secretary was on a railway train, and occupied a seat immediately behind two gentlemen who were engaged in a very earnest discussion about steel blooms. As their conversation was in a loud tone, the Secretary could not avoid hearing what was said, and the subject being one of public interest and the gentlemen evidently well posted, he did not think it necessary to avoid hearing. The conversation was carried on for some time, and the Secretary says he obtained more practical information, and what struck him as sound judgment, in that casual talk between two intelligent men than a person would gather in an elaborate argument. The gentlemen pointed out the necessity of a system of general classification of commercial designations, so that by giving the same thing a different name foreign manufacturers and importers could not annoy the Government with importunities for rulings at variance with the intent of the statute. They thought that the trouble with the statutes was lumbering them up with too many meaningless distinctions in terms, and the "manufactures not otherwise provided for" clause, which is the breach through which all those who desire to evade the law find an open thoroughfare. Simplification, rather than amplification, is what is wanted, they thought, especially in the schedules of iron and steel. The claims of the appellants in the recent hearing would only add to the complications of the steel-bloom question. The proposition is to class all blooms as ingots or bars, and not some in that schedule and something else of the same character as manufactures of steel not otherwise provided for.

It was stated at the Treasury Department to-day that the carrying of the hoop iron question to the Supreme Court would put a quietus, it is hoped, in the future on that never ending subject of litigation. The case, it is understood, was hoop iron cut to lengths of 11 feet and painted, but without a buckle permanently attached to the hoop iron, claiming ad valorem duty. This was identically the same description of merchandise involved in the suit tried in New Orleans last winter. In both these cases the lower courts decided that the goods were liable to an ad valorem duty; the Secretary of the Treasury thought that the wisest

course would be to have the question adjudicated upon by the highest tribunal. As the business of the Supreme Court of the United States is about four years behind, unless some special action be taken this case will not come up for consideration sooner than that time. The Government, however, in the meantime will collect the higher rate, of duty, so as to be secured in all the revenue the article would realize. It would be possible for the Attorney General to have the case advanced if it were of positive interest to the Government, but as the Government is losing nothing, it is not likely that they will be in such haste about it.

Among the recent decisions of the Department, officially announced, is one on steel hammer-molds, the importers appealing from the decision of the Collector on the pretext that they are "steel in bars." The Secretary of the Treasury replies to the Collector that "The Department is in receipt of his letter of the 31st ultimo, reporting further on the appeal of Mr. W. G. Wetherall from his assessment of duty at the rate of 45 per cent. ad valorem on certain steel hammer-molds, imported by him per Nova Scotia, June 9, 1881. The molds in question, it appears, are cast in a swaged form, from 4 feet 4 inches to 4 feet 9½ inches in length, each containing six hammers, and, when completed by separation and the boring of holes to receive the handles, are used by marble cutters; and the appellant claims that they are entitled to entry at the rate of 3 cents per pound, as steel in bars. Under date of January 4, 1871, the Department decided that hammer-molds of this description were liable to duty at the rate of 45 per cent. ad valorem, as 'articles of steel partially manufactured,' and your decision is therefore affirmed."

Another decision has been rendered on bar iron or nail rods, in an appeal from assessment of duty at 1½ cents per pound. The samples of the merchandise submitted showed that it was about 13-32nds inch wide and 7-32nds inch thick, and to be used in the manufacture of nails. It was classified at the rate of duty named, under the provision for bar iron. Schedule E, which imposes duties on metals, contains the following: "On 'bar iron, rolled or hammered, comprising flats less than ¾ inch or more than 2 inches thick, or less than 1 inch or more than 6 inches wide, \* \* \* 1½ cents per pound." The iron is flat, less than ¾ inch thick, and is less than an inch wide, and to that extent meets the conditions of the statute before quoted. The only remaining question was whether the merchandise was bar iron. The importers contended that it was commercially known as nail rods, and therefore it was not bar iron. Bar iron may be used for making nails, and the fact that this merchandise is known as nail rods does not render it necessarily not bar iron. Upon all the facts, the department decided to sustain the assessment of duty, and the Collector's decision was therefore affirmed. The provision mentioned in the appraiser's report, upon which the Collector relies for his classification, is quoted as follows: " \* \* \* But on all iron in slabs, blooms, loops and more advanced than pig iron, except castings, shall be rated as iron in bars, and pay a duty accordingly." The true reading of the law is as follows: " \* \* \* But all iron in slabs, blooms, loops, or other forms, less finished than iron in bars, and more advanced than pig iron, except castings, shall be rated as iron in bars, and pay a duty accordingly. \* \* \* This is not applicable to the present case, because the iron is not less finished than iron in bars."

There is probably no display on the fair grounds at Atlanta that is at once so suggestive and instructive, so comprehensive and yet so detailed, and at the same time of so much practical importance to the South as a whole, as the exhibit made by the Richmond and Danville Railroad. It shows almost at a glance the immense resources of the South, and, studied in connection with the other Southern exhibits, demonstrates beyond all question that the field of profitable investment in this section is practically boundless. In the display made by the Richmond and Danville combination there are, from North Carolina alone, copper ores, masses of great size and richness; refined copper in ingots and plates; lead and silver ores; iron ores from many mines; corundum, marbles,

soapstones, mica, in clear sheets a foot square; sandstones, flexible and other; chrome iron; kaolin; jewels, amethyst; carnelian, green and rose, beryls, true sapphires, zircons, &c., including fine specimens of the newly-found gem, Hiddendite, which rivals the diamond.

**Locomotive Engineers.**—The Brotherhood of Locomotive Engineers, which has its headquarters in Cleveland, Ohio, has just closed a year of unusual prosperity and peace. Mr. T. S. Ingraham, in the *Engineer's Monthly Journal*, says: "Between October of 1880 and the close of September of 1881 we have instituted 15 new lodges, with a gain of 1500 in membership. We have not had during the year a strike or danger of one, and nothing based upon one has been brought up for consideration. Our convention was a great success in more than one way, and had a large influence in our favor with the public." He adds that on January 15 a union meeting of all the lodges in the vicinity of this city will be held in New York under the auspices of Division No. 145. It will be purely social, and fully 30 lodges will be represented.

**Gilding Steel.**—Polished steel may be beautifully gilded by means of the ethereal solution of gold. Dissolve pure gold in aqua regia, evaporate gently to dryness so as to drive off the superfluous acid, re-dissolve in water, and add three times its bulk of sulphuric ether. Allow to stand for 24 hours in a stopped bottle, and the ethereal solution of gold will float on the top. Polished steel dipped in this is at once beautifully gilded, and by tracing patterns on the surface of the metal with any kind of varnish, beautiful devices in plain metal and gilt will be produced. For other metals the electric process is best.

Messrs. Philip S. Justice & Co., of No. 14 North Fifth street, Philadelphia, Pa., are putting into the market an article, the value of which merchants and manufacturers will not be slow to appreciate. The article is a solid-drawn mild steel tubing, and for bushings, sleeves, ferrules, &c., will be of the greatest value. In any place where bushings and collars have had to be bored out from the solid or made of rings welded up, both trouble and expense will be saved by using the steel tubes, which are smooth on both inside and outside. The samples we have seen are of a very satisfactory character. The tubes are made from ½ inch to 3½ inches outside diameter. The thickness of the walls varies from 1-16th inch up to ½ inch. This range of sizes is sufficient to cover a very considerable variety of work.

The deliveries of quicksilver at San Francisco in November amounted to 2736 flasks. This is the smallest quantity of any month in three years. In November, 1880, the total was 7500 flasks, against 5900 flasks in 1879. The receipts for the first 11 months of the year are reported at 48,500 flasks, against 51,800 flasks in 1880 and 66,200 flasks in 1879. The exports last month were the smallest in many years, amounting to only 727 flasks, valued at \$22,482. There were not a flask sent to Hongkong last month, an unusual omission, and only 200 flasks were shipped in October. This is all the more noteworthy from the fact that Hongkong is generally relied upon to take on an average 1500 flasks per month. The sudden advance from 38 to 42 cents drove Chinese buyers from the market.

A recent English invention, relating to furnaces for steam generators, consists of a double bridge wall, the space between the two walls being spanned by grating plates covered with loose fire-brick. Underneath this is a second grating, the openings through which are controlled by a correspondingly grating valve. The operation of this is said to be that the covering of the upper grating becomes intensely heated by the fire when it is clear, and each time the furnace is charged with fresh coal, air is admitted through the grating valve, and passing up through the covering, absorbs the heat. The valve is connected to the door so as to be opened with it and is closed gradually, thus furnishing hot air when needed, to prevent smoke.





PAWTUCKET, R. I.,

MANUFACTURERS OF

# FILES AND RASPS.

ESTABLISHED 1863.

Capacity 1000 dozen per day.

GOODS WARRANTED TO GIVE SATISFACTION.

## CHAMPION ONE-MAN SAW



WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

WHEELER, MADDEN &amp; CLEMSON MFG. CO., Middletown, N. Y.

HARVEY W. PEACE, VULCAN SAW WORKS, Brooklyn, E. D., N. Y.

Manufacturer of First Quality

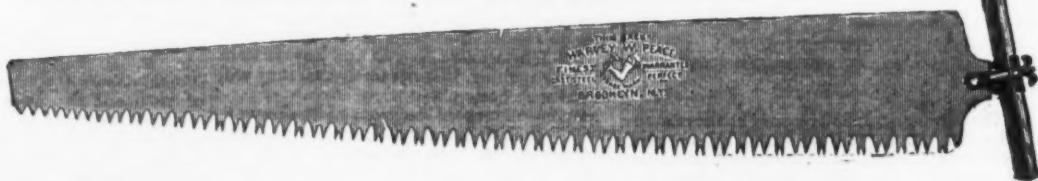
Hand, Panel, and Rip Saws,

AND KINDRED GOODS.

Also, MILL, CROSS-CUT AND CIRCULAR SAWS.

BAND SAWS

A SPECIALTY.

SOLD  
EVERYWHERE.

MANUFACTURED ONLY BY

ST. LOUIS STAMPING CO.,

ST. LOUIS, MO.

NEW YORK OFFICE, 57 Beekman St.

List on Application.

## SAMSON WIRE STRETCHER

M. D. SHIPMAN.

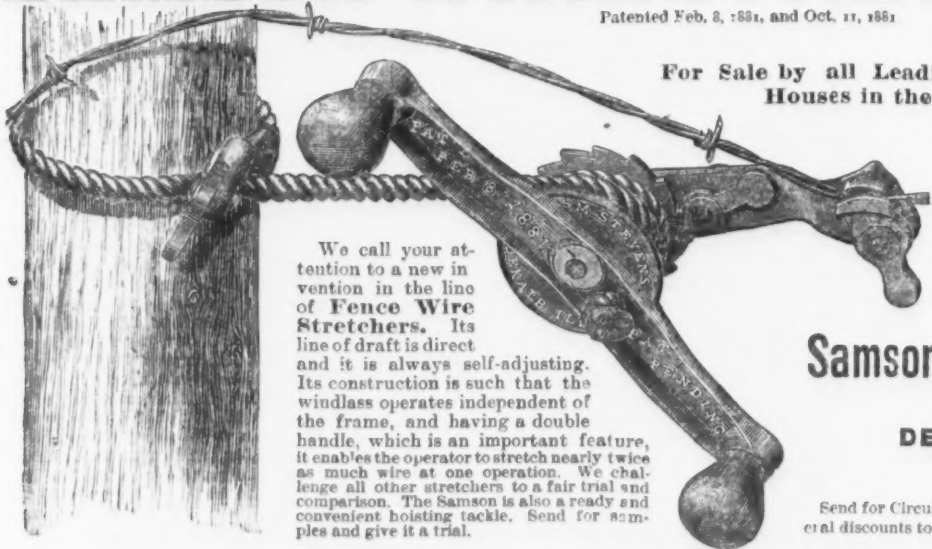
S. M. STEVENS.

C. E. BRADT.

L. E. SUNDERLAND.

Patented Feb. 8, 1881, and Oct. 11, 1881.

For Sale by all Leading Jobbing Hardware Houses in the United States.



MANUFACTURED BY

Samson Novelty Works,

DE KALB, ILLS.

Send for Circulars and Price List, showing our liberal discounts to the Wholesale trade.

JOHN E. SWAN & BROS., Ltd.,  
IRON MERCHANTS,  
Glasgow and Middlesbrough,  
Exporters of all brands of  
Scotch & English Pig Iron.

c. f. i. to America and f. o. b. British ports.

Old Iron Rails, Puddled Bars  
AND MANUFACTURED IRON.

THE FRENTRESS STEEL

## BARB WIRE.

Patented Dec. 14, 1875.

Reissued May 2, 1877.



The most popular Barb Fence Wire now offered in market, at prices which cannot be undersold. Send for Price Lists and Circulars.

MANUFACTURED BY THE  
ST. LOUIS WIRE FENCE CO., The Frentress Barb Wire Fence Co.,  
814 & 816 N. Second St., St. Louis, Mo. East Dubuque, Illinois.

## UNITED STATES SMELTING WORKS,

MANUFACTURERS OF



## BABBITT AND TYPE METALS,

Brass Castings and Solders of all Kinds.

PIG AND BAR TIN.

PIG AND BAR LEAD.

Pig Brass and Copper, Spelter, Antimony, &amp;c.

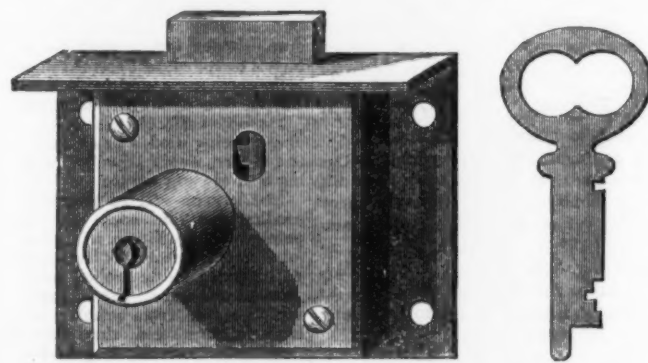
1615 &amp; 1617 Spring Garden Street,

PHILADELPHIA.

GEORGE HUNT,

M. S. STOKES.

## TWO NEW LOCKS.



## THE EAGLE LOCK CO.,

TERRYVILLE, CONN.,

Have just added two new and valuable patent locks to their already large variety, which will at once commend themselves to the trade.

No. 6101 (Brass) and 6117 (Iron), represented by the above cut, may be locked without using the key, by simply pressing on the plate in the end of the tube. The other patent, Nos. 6201 and 6217, is a lock similar in appearance, but is so constructed that with a small screw driver any dealer can adjust the lock to an endless variety of keys, or make his whole stock "alike" to fit one key, without opening the lock or affecting its security.

These patents have been applied only to drawer and cupboard locks as yet, but will soon be produced in chest and wardrobe locks.

For Sale by Hardware Jobbers Throughout the Country.

## THE PERFECTED REMINGTON



## TYPE WRITER

For the Heavy Correspondence of  
Business Houses.

Used and Recommended by Thousands of  
the Largest Houses in the Hardware  
and other Trades.

Send for circulars with prices and selected  
list of patrons and testimonials.

Every Machine Guaranteed  
Satisfactory.

E. REMINGTON &amp; SONS,

281 &amp; 283 Broadway, NEW YORK.

124 S. 7th St., Philadelphia. 38 Madison St., Chicago.

## THE AMERICAN MACHINE CO.,

MANUFACTURERS OF

## HARDWARE SPECIALTIES.

Office and Factory: Lehigh Ave. and American St., Philadelphia. Branch House: No. 128 Chambers St., New York  
SPECIALTIES: Fluting Machines, Hand Fluters, Plating Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.



## British Iron, Steel and Hardwares in 1881.

(From our Regular Correspondent.)

Now that the current year is drawing near to its conclusion, and accounts, balance-sheets, and stock-taking are deemed of more importance, relatively, than other matters, it may prove useful as well as instructive to attempt a review of the chief features of the business of the twelve months. We cannot, it is true, deal with the complete statistics of production and disposal at present, but we possess a sufficient number of ascertained facts, and so considerable an amount of statistical data, that we may advantageously attempt to sum up the year's proceedings while they are comparatively fresh and likely to prove useful.

The period cannot be termed a year of unbroken activity, nor, on the other hand, would it be correct to class 1881 with the bad years. In many departments of the iron and steel trades, indeed, there cannot be the slightest doubt that the production, when fully elicited, will be found to have been materially in excess of anything ever before attained. It must be borne in mind, in fact, that the low selling prices of certain classes of materials and commodities during a portion of the year have been in consequence of this large production, and not in any sense owing to its absence. Profits were limited, it is well known, during several months, but it is probable that in numerous instances the augmented turnover may have compensated, in a measure, for the lower margins on separate items. This may not be true of many lines of goods, however, and in any case it should be remembered that we carry on business nowadays under conditions widely differing from those in force a few years ago. In all the ordinary branches of the metallurgical industries the era of enormous profits has ended. It is no longer possible to clear cent. per cent.; indeed, to pay all outgoings, and secure a clear 15 @ 25 per cent. is pretty much an outside result. Every year competition grows keener both at home and abroad. We still have the whole world as our market, but we no longer monopolize the orders of the non-producing nations. On the Continent of Europe we are confronted everywhere by diligent and intelligent rivals, and in the United States we have foes worthy not only of our steel, but also of our iron. In the latter case, unfortunately, the "worthiness" takes the form of a prohibitory tariff, which excludes a majority of our manufactures from the country. Bearing these considerations in mind, we may not improbably regard 1881 as a good average year, and may venture to hope that it will prove to have been the means of securing an era of greater prosperity during 1882.

### FIRST QUARTER.

The year opened favorably, with hopeful anticipations in almost all directions, and with a nearly unanimous impression that the iron trade was in a sound and healthy condition. There were not a few persons who held most sanguine views as to the then near future; indeed, it would be safe to state that the majority of the members of the trade entertained the belief that they would make a fresh departure in a forward direction from the New Year's advent, and go ahead without retrogression for a very long time. The statistical position at the end of 1880 had been found to be somewhat more favorable than had been feared, the 739,000 tons of Scotch and 250,000 tons of Cleveland pig being lower totals than had been fore-shadowed. In consequence of this hopefulness and the general disposition to "look ahead" one of the first movements in January was a rise of 2/ in Scotch warrants, which went up to 53/, while Cleveland No. 3 was quoted 40/ @ 41/, and West Coast hematites of ordinary makers' brands were held at 64/ and No. 3 at 62/. The manufactured iron branches were quietly engaged, and were encouraged by the more favorable reports received from the Continent and the United States. The hardware manufacturers were not busy in the strict sense of the word, but they had a fair amount of work in hand, and expected that their orders would become more numerous as the year grew older. At Sheffield, in fact, the cutlery, tool, and electro-plate trades were well employed, and at Birmingham and Wolverhampton matters were very much as they are usually just after the Christmas holidays. The collapse of Brown, Bayley & Dixon (Limited), Sheffield (since reconstructed and again in regular operation), excited no particular surprise, and had no ill effects upon similar concerns. The steel-rail mills in the early portion of January were respectively engaged, 40 lb section and the like being quoted £6. 12/ 6, and heavy sections £6. 5/ @ £6. 10/ per ton, with numerous inquiries. Iron rails were quiet at £5. 2/ 6 @ £5. 7/ 6, while Welsh bars were steady at £5. 2/ 6 @ £5. 5/. In Staffordshire the list houses maintained marked bars at £7. 10/, at which limit business was only on a limited scale. Wrought scrap was reported scarce and strong at £4 @ £4. 5/. It, with blooms, was in some demand for the United States. About the second week of the month Scotch pig assumed a steady tone, although warrants were 51/ 6, Gartsherrie No. 1, 63/; No. 3, 54/; Eglinton No. 1, 54/; and No. 3, 51/ 6. The Clyde shipbuilders were fully occupied—in deed, it will be seen that throughout the year this important industry has been prosperous, and increasingly so as the year nears its close. There were 118 furnaces at work in Scotland at this juncture. In Cleveland there was also a steady market, No. 3 being 42/, the local manufacturers of plates and angles having an enormous demand, mainly from the shipyards. In the middle of January complaints began to be heard from Staffordshire, and ordinary merchant irons became distinctly weaker. The tin-plate manufacturers discussed the question of limiting the make, but arrived at no definite decision. At the end of January, Sheffield, Birmingham and Wolverhampton experienced a better export call for hardwares, but the home market remained very dull and profitless.

February opened quietly in all directions,

Crude irons were without special changes, but the large and growing reserve stocks depressed the market, and made speculators, as well as trade buyers, very shy. Scotland had added 2000 tons to Connal's stores during January, and in Cleveland the increment had been nearly 5000 tons. Scotch warrants consequently declined to about 51/ 1, and Cleveland No. 3 to 40/, makers' iron being lower in proportion. Steel rails continued in good demand at, nominally, £6. 10/ to £7, and there was a good export inquiry for old rails and wrought scrap. In merchant iron little new business was reported, and competition was proportionately strengthened. Common Staffordshire bars sold at £5. 7/ 6, although there were those who held out for higher figures under the impression that the agitation of the miners and ironworkers for higher wages might cause serious disputes, and a resulting interference with the production. In South Yorkshire the colliers threatened a general strike for a 10 per cent. advance, but in the end wiser counsels prevailed, and the agitation subsided. At Sheffield the cutlery trade was fairly brisk, with a strong call for razors. Tinplates were dull, but thought to be improving. The second week of February brought no improvement; on the contrary, general quiet prevailed, and renewed complaints were general as to the severity of competition and the smallness of profits. The uneasiness of labor continued to excite fears, and, *inter alia*, the Wear shipbuilders (platers, &c.), obtained an advance of 7½ per cent. on piecework and 2 per week on day wages. The Teeside operative engineers also agitated for higher payments, but the employers, headed by Bolckow, Vaughan & Co., stood firm and refused their requests, despite threats of strikes. In the same way the cutlery manufacturers of Sheffield declined the demand of the table-blade grinders for the rise implied in a return to the "statement" of 1859. The dullness of the iron trade continued, and became more noticeable as the month advanced, especially as regards pig irons. The evil influence of the overproduction was felt everywhere, and it could not be denied that there had been an augmented output, with a coincident decrease in shipments and home consumption. Altogether the surplus was estimated at about 1,200,000 tons, and the legitimate demand was so limited, comparatively, that fully 550,000 tons of Scotch warrants were held by speculators. The failure of a firm of "bear" operators at Glasgow about this time disturbed the market. Their operations had been to the extent of tens of thousands of tons daily, and they had oversold 30,000 tons when they suspended. The money market becoming easier, with a 3 per cent. bank rate, somewhat favored speculators, as well as legitimate buyers. The iron and steel works, it should be said, meantime were fairly engaged. Tin plates remained dull, notwithstanding strikes of the workmen in some quarters, the reserve stocks being set down at 500,000 boxes in the Liverpool railway stations alone. Seventeen works were stopped at the time, decreasing the production 34,000 boxes weekly, or 150,000 monthly, but even this failed to resuscitate prices, and a suggested restrictive policy had no greater influence. At the end of February the only feature of note was a better American demand for hoops, and some encouraging signs in the steel-rail branch. The hardware trades were only moderately engaged.

March opened with bad weather and very dull markets in all directions. Crude irons were universally weaker, partly owing to the quiet demand and partly by reason of forced sales by second holders. Scotch Warrants were 48/ 8; Gartsherrie No. 1, 59/; and No. 3, 51/; Cleveland No. 3, 38/ 6, and Hematites, 2/ 6 @ 5/ cheaper. The net increase in Cleveland stocks in February had been over 21,700 tons, with 120 furnaces going. The Darlington Iron Company suspended payment without exciting any particular remark. The Board of Trade returns for February showed our total exports to have been 16,835,550 lb, against 16,504,708 lb in 1880. The iron and steel shipments were 192,870 tons, valued at £1,551,372, against 264,252 tons, valued at £1,989,972. The only improvement was in pig and railway iron to the United States. Toward the middle of the month everything grew even duller, and there was an unquestioned, and perhaps unreasonable, pessimism everywhere, save as regards rails, blooms, and a few special lines. At Sheffield only the heavy trades showed respectable results. The stoppage of the Northfield Iron Company, of Rotherham, excited no surprise. Finer weather provoked a little better anticipations, but the home market seemed so entirely hopeless that the most sanguine scarcely ventured to look for an early improvement. By the last week of the month Scotch shipments showed a total decrease of 67,922 tons, 121 furnaces being at work, and in Connal's stocks 535,630 tons. About this time the British Iron Trade Association issued its statistics as to 1880. Among other points these gave the aggregate stocks on hand on December 31, 1880, as being 1,541,411 tons—figures which, even now, did not tend to brighten the outlook. Thus the first quarter of the year began well and ended most indifferently.

### SECOND QUARTER.

April opened favorably in respect of weather. Operations in Scotch warrants and in pig iron itself were, nevertheless, "frosted" by the 538,000 tons at Glasgow and 413,000 tons in Cleveland, to say nothing of the reserves elsewhere. Warrants at Glasgow stood at about 48/ 10, and Cleveland No. 3 at 39/, makers' irons being in proportion. Hardwares were still quiet, a notable incident being the increase of Nettlefold's discounts on wood screws by 10 per cent. The heavy trades were relatively better employed than the lighter industries, especially in Bessemer production. With a continuance of fine weather and the consequent opening of the Northern ports, the second week of the month of showers—largely absent on this occasion—brought a slightly improved tone in pig iron, while Staffordshire finished iron officially declined. The Scotch ironmasters discussed the question of limiting the output, but arrived at no decision to that effect. April went out without special features to note.

May brought no change of importance, the iron market being dull, and the crude departments still depressed by the overproduction. Connal's held 549,751 tons at Glasgow,

and warrants were 47/ 8, with leading No. 1 makers' brands at 57/ 6. Cleveland No. 3 was 38/ 6, and ordinary West Coast hematites (with 58 furnaces working) at 59/ for No. 1, and 57/ for No. 3. The iron works were moderately engaged, and the Bessemer steel works still fairly busy. Early in May it was thought that tin plates showed increased firmness, with lower stocks, and an advance of 9d. @ 1/ per box was reported, making ordinary cokes 16/ @ 16/ 6 per box f.o.b. Liverpool; a further rise was prophesied. Notwithstanding the plenitude of money, Scotch warrants became easier, and during the first week of May went down to 47/ 2, Cleveland No. 3 at the time being quiet at 38/. In Cleveland the total stock on May 1st was 411,981 tons, an increase of 5624 tons in April. West Coast hematites were dull at 58/ for ordinary No. 1 and 56/ for No. 3, with 57 furnaces working. In South Wales some commotion was caused by our announcement that the Cyfarthfa Works would thenceforward be withdrawn from the iron-rail trade and probably devoted to steel. The mills had produced about 800 tons of rails weekly, and, as is well known, the Crawshays had been pioneers in the iron-rail industry. The Board of Trade returns for April were unfavorable, and, therefore, helped to confirm the existing dullness. As the month progressed no improvement was visible, and, as a natural sequence, a discussion arose in Cleveland as to the advisability of effecting some limitation of the output of pig iron. Toward the end of May several causes seemed to unite in bringing about a slight change for the better. The extremely fine weather—better than usual at the season—favored harvest prospects, and the ultra low prices apparently convinced merchants and others that they had nothing to gain by further delay.

June, accordingly, brought a somewhat alleviated state of affairs in point of orders, but prices of all kinds of iron were excessively low. Here and there the works were found to be doing a little more in several branches of the iron trade proper, while the steel-rail mills were well engaged, not only in England and Wales, but also on the Continent and in the United States. Scotch warrants improved to 46/, but on the West Coast several furnaces were stopped. Elsewhere similar stoppages were noted. The Clyde shipbuilding yards continued very busy, the May launches reaching an aggregate of 36,753 tons, against 17,000 tons in the same month of 1880. In Cleveland stocks of pig increased 13,873 tons during May, and in Scotland constant additions were recorded. Hardwares were moderately inquired for, but prices continued excessively low. As the end of the month approached there was again the rumor that the production would be restricted in the North, and upon the strength of that report prices stiffened somewhat. Hardwares began to be in decidedly better demand, chiefly owing to the excellent influence of the fine weather upon the home market and the leveling up elsewhere.

### THIRD QUARTER.

July brought with it a few further symptoms of a cheering nature, and the beginning of the second half of the year was attended by not a few hopeful indications. The German (Westphalian) ironmasters had decided to reduce their output of pig iron by 5000 tons monthly, or 11 per cent., and on July 4th the Cleveland ironmasters passed a resolution advocating a policy of restriction, and inviting the Scotch ironmasters to join them in its embodiment. Cleveland stocks reached 431,326 tons, an increase of 5472 tons in June, and Scotch stocks in Connal's stores alone were 509,555 tons. Cleveland No. 3 was 37/ 3, and Scotch warrants were 46/ 10, with makers' iron *pro rata*. West Coast hematites were rather better, with 55 furnaces working, and with larger shipments. In finished iron there was a rather better tone, owing to the giving out of good export orders, but in a general way underselling was much in vogue and profit meager. A steady American call for strip and hoops was reported, and sheets were strong, lathe-ends at £7/ 6. August opened under these rather more cheerful auspices; indeed, the remainder of the year presents a record which is, fortunately, mainly one of steady progress, with checks here and there of a relatively unimportant description. At the period under review, perhaps, heavy manufactured iron and merchant sorts moved off most freely, and in some cases at advances of 2/ 6 to 5/ per ton. This enforcement of higher rates alone demonstrated the substantial character of the change and, *pari passu*, the comparative rapidity with which it had come about. It soon became known that even common bars had felt the alteration, while there was plenty of evidence of the movement in Bessemer sorts, rails, wire and rolled iron. Bolckow-Vaughan, previously busy, booked an Australian order for 17,000 tons, and Moss Bay 15,000 tons for the same part of the world. The Board of Trade returns for July were favorable, showing a slight increase over July, 1880, and an expansion in the shipments of many kinds of iron and steel, especially bar, angle and rod, railroad, wire, hoops, sheets and plates. The British Iron Trade Association issued a report showing the stocks of pig iron on June 30th to have been 1,608,761 tons; the production during the six months, 1,134,821; and consumption, 3,824,521. Crude irons in Scotland and Cleveland continued weak in price, but with a large and growing turnover, particularly in the North of England. Scotch warrants were 46/ 4, and Cleveland No. 3, 37/ 3. Hematites were stronger and in better request, with large shipments. The harvest began and was well got in in the South and Southeast of the country, but in the second week of the month the weather became broken and unfavorable, with results which are still fresh in mind—namely, a depreciation of perhaps 20 per cent. in the aggregate returns of the whole country. This knowledge, however, was not attained at the time of which we are now writing. With the exception of pig iron, almost all other sorts of iron and steel improved, and the works were enabled to boast of ample employment. The state of the rail mills may be inferred from the mention of the fact that in August one Sheffield firm had orders for over 100,000 tons upon its books. The holiday nature of the period, perhaps, retarded some few transactions, but things had clearly obtained a start. August came

to an end with fair prospects and a better record as to actual sales than several preceding months.

At the beginning of September, Scotch warrants were 45/ 11, with fair shipments and plenty of work at the foundries, shipyards, &c. There were then 118 furnaces blowing. Hematites continued firm, with a good demand at 58/ for mixed lots, 58/ 6 for No. 1, and 56/ 6 for No. 3 brands. The shipments were very large. Cleveland pig was quiet, but steady, No. 3 at 37/. Stocks had increased 500 tons only, to 438,151 tons, during August—a fact which led to the expectation of an early change for the better. In finished iron there was no appreciable alteration, but the works were for the most part fairly engaged. About the second week of the month greater animation was observable, and many signs were noticeable of renewed activity in the leading branches of the iron and steel trades, as well as in many lines of hardwares. The Board of Trade returns for August showed total exports worth £21,180,695, against £19,114,315 in August, 1880. Iron and steel figured for 361,271 tons, worth £2,482,518, against 294,586 tons, value £2,207,169, in August, 1880. The average price of the iron rails shipped was £5. 16 11¼, and of the steel rails £6. 12 8¼, while the steel (unwrought) averaged £7. 14 6¼ to United States ports. Another feature which tended to excite the market was the proposal of the Scotch ironmasters to reduce the production. They afterward met the Cleveland smelters at Carlisle and arranged to stop a specified percentage (12½) of the furnaces in each locality for a period of six months from October 1. As soon as the mere rumor of this intention got abroad pig iron experienced a bound upward, and, as we know, has since been on higher ground than for a long time previously. At the same time, many new orders for manufactured iron were placed, and the steel-rail mills had no diminution of activity. Thereafter, to the close of the month, a brisker tone was observable all round; prices of crude iron were lifted several shillings, and almost all sorts of iron moved onwards. Scotch warrants reached 51/ and thereabouts; Gartsherrie No. 1, 60/, and No. 3, 52/ 6; Cleveland No. 3, 42/ 6, and ordinary West Coast Hematites, 60, for No. 1 and 58, No. 3.

### FOURTH QUARTER.

October did not bring quite a "boom" of the American kind, but it opened in a very sanguine manner, with the utmost hopefulness on almost all sides, and with the substantial background of well-employed works and numerous inquiries. There were 562 furnaces blowing on October 1, against 567 on September 1, and 561 on June 1, not counting the 15 furnaces to be stopped under the restrictive arrangement. These furnaces were blown out on October 1 as arranged. The Board of Trade returns for September were of a very encouraging tenor, the exports having reached £20,900,563, against £20,027,347 in September, 1880. Iron and steel reached 376,517 tons, worth £2,562,268, as compared with 297,013 tons, worth £2,204,285, in the same month of 1880. The average price of the iron rails was £5. 15 9¼ per ton, and of the steel rails £6. 11 3¼. These and other favorable figures all tended to strengthen the market, which was active in almost every section. Scotch warrants touched 53/ 6, Cleveland No. 3, 43/, and ordinary hematites 61/ for No. 1. As the month grew older crude iron became quieter, although the works everywhere were not less well engaged. In many departments, indeed, new orders were plentiful and buyers pressing. The month ended without any change of importance, save the relative quietude just mentioned. The official return of Mr. Waterhouse for the September quarter showed the average selling price of all kinds of Cleveland iron to have been £5. 19/ 6, which left wages unaltered. The return again showed the enormous preponderance of plate-making in the North of England.

November opened with a slight suspicion of quiet in the open market, but with excellent advices from the Continent, the States, &c., as well as no diminution of occupation at the works. In Cleveland the stocks decreased 22,000 tons in October, leaving 412,450 tons in hand, but in Scotland the stock in Connal's hands continued to grow, and amounted to 609,745 tons. Hematites were being freely shipped and were steady. The Bessemer works and rail mills were remarkably busy, blooms and rails being alike in demand. At Sheffield the heavy branches showed many symptoms of strength, and the light industries of the whole of the hardware centers were generally active. Then, as now, profits were meager, but there was, at all events, a considerable turnover. Scotch warrants were about 50/ 6, with a limited demand for makers' iron, while Cleveland No. 3 was about 41/ 3; Northern plates, £6. 7/ 6; angles, £5. 18/ 9, and bars, £6. 2/ 6. Hematites were steadier, with large shipments and a good inquiry for home use. An attempt was made to convert the undertaking of Newton, Chambers & Co. into a "limited," but the public did not fully respond, not from any distrust of the concern, but from the general want of confidence in "limited" ventures arising out of former failures of these companies. The Board of Trade returns for October again showed a favorable development, the total exports amounting to £21,224,081, against £18,685,060. The iron and steel shipments reached 386,658 tons, against 286,362 tons in October, 1880. Manufactured iron grew a little quieter, and there was a slight diminution in the pressure of orders, but prices remained as before. The locomotive shops and general engineers, however, became busier, and there was no falling off in the demand for blooms and rails. This fact was demonstrated by the dismissal of 400 ironworkers at Rhymney, owing to the increased attention paid to steel at that establishment. Some kinds of hardwares, including malleable rails, were again advanced in price. Toward the end of the month the Scotch bar iron manufacturers declared a rise of 5/ 3¼ ton, and further large orders for steel rails were reported as having been received by Sheffield and other houses. The locomotive engineers and shipbuilders also secured many additional contracts. At the end of the month crude irons were quiet, but the works generally were still busily engaged. Many lines of hardwares, electro-

plate, &c., were in free request, not a few of the manufacturers having an abundance of work for the remainder of the year.

December came in without excitement, but with many satisfactory features, there being few branches of the metallurgical industries at all indifferently engaged. Crude irons were, perhaps, the weakest, but they received a fillip from the large reduction (33,000 tons) made in Cleveland during November, and were also strengthened by the Board of Trade returns. These statistics showed the November exports to have been worth £20,713,164, against £18,864,700 in the same month of 1880. The iron and steel shipments were 399,436 tons, valued at £2,296,306, against 269,464 tons and £2,060,424 in the same month last year. These and some collateral influences combined to send up prices of Pig, and Scotch warrants reached 53/ 4 at the close of the first entire week of the month, although Connal's Glasgow stores held 619,000 tons, besides a further 338,000 tons (estimated) in makers' own yards, while the Cleveland total reserve was 393,000 tons, and that on West Coast about 53,000 tons. Finished iron was unchanged, with a fair general demand for bars, and a large output of sheets, galvanized fencing wire, hoops and plates, rolled metals advanced ½d. 3/ 8, and tinned hollow-wares underwent a reduction in discount of 2½ per cent., while tin plates grew stiffer, owing to dear sheet iron and the extremely high price of tin. A very strong call for hematites was reported, and the rail mills were so full of work that makers declined to undertake new year deliveries. At Birmingham, Sheffield, Wolverhampton, &c., employment was brisk, and, as we know, still remains the same. Beyond this it is scarcely necessary to go with our review, inasmuch as it has been brought down to the period of current transactions. It may facilitate future reference, however, if it is placed on record that the year is closing under reasonably favorable conditions. There is plenty of work in all directions, and there are numerous inquiries for future deliveries. Profits are not in all cases extensive, indeed, in some instances they are meager—but it is generally believed that with the advent of the new year we may witness a further departure toward higher selling rates.

### The Duration of English Iron Ores.

Of late years no question of a national and industrial character has received so much attention, or caused greater interest in England, than that relating to the probable duration of English coal fields. Equally important, probably, is the question as to how long some of the ironstone fields are likely to last. The two, indeed, are inseparably connected, and the decline of the one must be followed by a corresponding falling off in the other. Iron is the great lever which has raised England to the position it has so long enjoyed as one of the great manufacturing centers of the world, so that the falling off in the supplies of the raw material from which iron is produced or the fuel with which it is smelted, would be a most serious matter as regards English manufacturing and commercial prestige. English stores of ironstone, large as they are believed to be, are considerably below those of other countries, where the drain upon them is trifling in comparison. The history of the iron trade has shown that it has always flourished most in localities where there was a plentiful supply of fuel, and when that has been exhausted it has migrated to other more favorable districts, where the necessary smelting material was more abundant. Thus Kent and Sussex, with the addition later on of the West Riding of Yorkshire, were the largest iron-producing places in the kingdom, the fuel used being supplied by the woods and forests, the terms "wold" or "weald" being given to a tract of country lying between the North and South Downs, and occupied by extensive forests. The ore used was that found in the Wealden rocks, and in the lower green sand of the Cretaceous series, and the Romans have left undoubted proof of their having worked the Hastings sands and clays for the ores of iron they contained, but these are now a sealed book to ironmasters; but some day their value may be recognized, when the present flourishing districts are things of the past. The formation known as the lower greensand derives its name from the position it occupies in the Cretaceous series, and from the greenish color of the sands, while some of the beds are of a yellowish cast. The formation is observable throughout the whole of the Wealden country of Kent and Sussex, upon a portion of which the Wealden rock rests, and in the course of its whole range from Cambridgeshire into Wiltshire it presents the appearance of a highly ferruginous sand, with a good deal of concretionary oxide of iron. At one place near to Devizes the ironstone has been opened out in an isolated outlier of the lower greensand 50 feet in thickness. The lower greensand extends into Bedfordshire, where it is met with 100 feet in thickness, and forms a considerable portion of the ground of the Isle of Wight.

The denuding of the forests in Kent and Sussex, and the smelting of ironstone with coal instead of wood, led to the iron trade traveling northward; but long after Dud Dudley had made iron with coal at his furnaces in Staffordshire, having obtained a patent for that purpose from King James, which was to last for fourteen years. Dudley, as one of the advantages he claimed for his patent, said that it tended to the preservation of Great Britain's woods and timbers. After leaving the Weald, the iron trade settled down in localities where there was plenty of coal as well as ore. The blackbands and the carbonates of the coal measures are those that were principally worked, along with some of the hematites, up to some thirty years ago, since which vast tracts of ore have been found under more recent formations, and are now being most extensively used, and will be more so. But the blackbands and carbonates are not only being worked, but are being abandoned, owing to their thinness. In South Staffordshire the ironstone is associated with the coal measures; the blackband, 18 inches in thickness, and several of the seams of coal are roofed with iron ore, and greatly enhance the value of the beds. Yet in 1855 Staffordshire and Shropshire produced 2,865,000 tons of ore, and in 1880 only 2,046,000 tons. This



## Cutlery.

## FRIEDMANN &amp; LAUTERJUNG,

Manufacturers of  
PEN AND POCKET CUTLERY,  
Solid Steel Scissors, Shears, Razors, &c.  
Sole proprietors of the renowned full concave  
"ELECTRIC RAZORS,"  
And the celebrated "ELECTRIC SHEARS." Nickel Plated  
Howe.  
Agents for the BENGALL RAZORS.  
AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.  
91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

## LAMSON &amp; GOODNOW MFG. CO.,

Salesroom and Warehouse, 38 Chambers Street, New York City. Factories, Shelburne Falls, Mass.  
Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest  
in wood and iron handles.

OUR BUTCHERS' and HUNTERS' KNIVES  
Are warranted to be equal in style, finish and quality, to any goods made in the world.  
"COMPARE, THEN JUDGE."

We are the sole owners of the Gardner Patent Guard and Rest for Carving Forks, and  
the manufacture of fine carvers is with us a specialty.

## AMERICAN MADE RAZORS



J. R. TORREY, MANUFACTURER OF STROPS  
J. R. TORREY RAZOR CO., MANUFACTURERS OF RAZORS.  
In all styles.

To introduce we offer HOLLOW GROUND RAZORS at \$1.50, \$1.75, \$2; Ivory, \$2.50. Our SWED-  
ISH GEN RAZORS, \$1.75, \$2; Ivory, \$2.50. All our own make, and warranted the best cutters in  
the world. As razor makers we know what is needed to sharpen a dull razor, and will mail for 75 cts. a  
strop warranted to set a fine edge to any razor. If in morocco case, \$1.  
Factories at WORCESTER, MASS. Catalogues to the trade.

## JOHN WILSON'S CELEBRATED

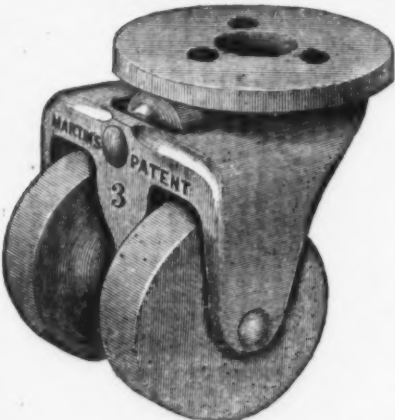
TRADE MARK.  
FOUR PEPPERCORNS AND A DIAMOND.  
GRANTED A D 1766 BY THE  
CORPORATION OF CUTLERS OF SHEFFIELD  
AND PROTECTED BY ACT OF PARLIAMENT  
REGISTERED ALSO AT  
WASHINGTON U.S.A. ACCORDING TO ACT OF  
CONGRESS  
ALSO AT LEIPZIG, IN  
ACCORDANCE WITH THE GERMAN TRADE  
MARKS REGISTRATION ACT.

JOHN WILSON'S CELEBRATED BUTCHERS' KNIVES,  
BUTCHERS' STEELS,  
AND SHOE KNIVES.  
It having come to the knowledge of  
JOHN WILSON that Counterfeit Butchers'  
Knives, purporting to be of his manufacture,  
are being sold in the United States, he her-  
eby cautions all purchasers of his Knives and  
Steels to be on the alert against such im-  
position.  
JOHN WILSON also hereby gives Notice,  
that it is his determination to institute Legal  
Proceedings against any person or persons who  
may be detected infringing his Trade Mark.  
Every article of JOHN WILSON'S manu-  
facture, bears the Trade Mark, in addition to  
the Name.

WORKS: SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750

## PHOENIX CASTER CO.,

Indianapolis, Ind.



Hibbard, Spencer & Co., Chicago, have  
sold our Casters as follows:  
1879.....\$322.60  
1880.....590.92  
1881 (year half out only).....823.54

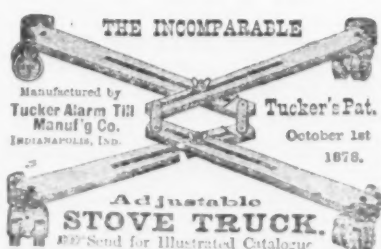
We have just issued a new Catalogue,  
which we would be pleased to mail with  
terms upon application.

## PHOENIX CASTER CO.,

Manufacturers,  
INDIANAPOLIS, IND.



Our Pump is so uniform, simple,  
strong, and reliable, that it has  
diverted all competition from the field.



Send for Illustrated Catalogue

## THE SHRODER DOOR SPRING.

The BEST DOOR SPRING in the MARKET.

It will hold a door open as well as shut, and by its peculiar form has  
four inches more leverage to hold a door shut, closing it tight, where  
all other Springs fail. No latch required with this Spring.

DELONG & SHRODER, Manufacturers,  
Warren, Illinois.

Correspondence solicited with jobbers and large dealers. We will  
send a full-size Spring or a small model free, on application. Try it.

## REMOVAL.

Please notice that we have removed from No. 295 THIRD AVENUE to  
No. 37 Warren Street, near Church St.,  
Where we hope to be favored with a continuance of your generous patronage.

J. M. FARRINGTON & CO.,

Successors to DAY, FARRINGTON & CO., Manufacturers of

LOCKS, KNOBS, GONGS, BLANK KEYS,  
Wrought Store Door and Flush Bolts, Silver Plated, Ornamental Bronze and other Hardware.

## Cutlery.

## CORPORATE MARK,

Joseph Rodgers & Sons'

(LIMITED)  
CELEBRATED CUTLERY,  
No. 82 Chambers Street, New York.  
P. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons'  
productions having considerably increased, they  
have, in order to meet it, greatly extended their  
Manufacturing Premises and Steam power.  
To distinguish Articles of Joseph Rodgers  
& Sons' Manufacture, please to see that they bear  
their Corporate Mark.

P. O. Box 3962. ESTABLISHED 1836.

Alfred Field & Co.,  
COMMISSION MERCHANTS,  
New York, Birmingham, Sheffield, Liverpool.

## Guns and Pocket Cutlery.

## SPECIALTIES.

Headquarters for  
ELEY'S BROS. GOODS, WRIGHT'S ANVILS,  
WILSON'S BUTCHER KNIVES, &c.  
WOSTENHOLM'S POCKET CUTLERY AND RAZORS,  
FIELD, FRASER & CONTINENTAL POCKET KNIVES,  
BUTCHER'S FILES, TOOLS AND RAZORS,  
JOSEPH ELLIOTT'S CELEBRATED RAZORS,  
WESTERN FILE CO.'S FILES,  
ENGLISH AND GERMAN GUNS,  
ROBERT SORBY & SONS' SHEEP SHEARS,  
STUBS' FILES, WESTERN FILES,  
GREAVES' SHEEP SHEARS,  
CHESTERMAN'S TAPES,  
GERMAN COIL AND HALTER AND OTHER CHAINS,  
BRADSHAW'S TROWELS AND HOES,  
CANASTOTA KNIFE CO.'S POCKET KNIVES,  
Etc., Etc., Etc.

All sorts of Hardware and Merchandise for im-  
port and export purchased on commission.

Silver Medal, 1878-Paris.



JOHN SPENCER & SON,  
Albion Steel Works, Sheffield,  
MANUFACTURERS OF  
FILES  
AND  
STEEL.

Table Knives, Razors, Shovels, &c., &c.,  
of every description.

## CORPORATE MARK.

JOHN SPENCER & SON,  
SHEFFIELD  
Granted 1749.

FURNESS, BANNISTER & CO.,  
NEWARK, N. J.  
Manufacturers of

## TABLE CUTLERY.

PRICES FURNISHED ON APPLICATION.

## Patented Articles of Malleable Iron.

Hammer's Malleable Iron Oilers.  
Three Sizes. Nos. 1, 2 & 3.



No. 1.

Hammer's Adjustable Clamps.

Hammer's Mail Iron Hand Lamps.

Hammer's M. I. Hanging Lamps.

NEW pattern Heavy Screw Clamps;  
strongest in the market.  
For sale by all the principal Hardware Dealers.  
Send for Price List.

Malleable Iron Castings  
of superior quality, and Hardware Specialties in  
Malleable Iron made to order.

HAMMER & CO.,  
BRANFORD, CONN.

## HAMMOND'S Window Springs

Lock and support upper and lower  
sashes—all sizes. Are very conven-  
ient, simple and durable. Sample  
to the Trade Free.  
W. S. HAMMOND,  
Lewisberry, York Co., Pa.  
Circulars give full instructions.

## Cutlery.

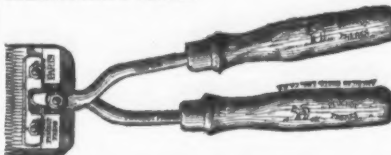
McCOY & SANDERS,  
Hardware, Cutlery, &c.,  
P. O. BOX 390, NEW YORK.

Sole Agents for

THEILE & QUACK'S CELEBRATED CUTLERY.  
WADE BROS. AND TYLER & CO.'S CUTLERY.  
IRVING CUTLERY CO.  
ELMWOOD CUTLERY CO.  
SHEARS, MIDDLETOWN SHEAR CO.  
WROUGHT IRON TACKLE BLOCKS.  
EADY'S DIFFERENTIAL PULLEYS.  
PEUGEOT FRERES' FRENCH HORSE CLIPPERS.

## SPECIALTIES.

WOSTENHOLM'S POCKET CUTLERY AND RAZORS.  
WADE & BUTCHER'S RAZORS.  
BENGAL AND GENUINE HAMBURG HOLLOW  
GROUND RAZORS.  
JOS. RODGERS & SONS' CUTLERY.  
GERMAN COIL AND HALTER CHAINS.  
FLYERS, NIPPERS AND TOOLS.  
CHESTERMAN'S TAPES.



Peugeot Freres' Horse Clipper.

ROBERT SORBY & SONS,  
SHEFFIELD,  
MANUFACTURERS OF THE CELEBRATED

Kangaroo Sheep Shears.



ALFRED FIELD & CO.,  
93 Chambers St., NEW YORK,  
SOLE AGENTS.  
Send for price list and terms.

ESTABLISHED 1853.

E. E. EATON,  
GUNS,  
AMMUNITION,

Fishing Tackle,  
CUTLERY,  
53 State St., Chicago.

MANN'S  
Trolling Spoons



Sixty varieties manufactured, suitable for Trol-  
ling for all kinds of fish that will take an artificial  
bait, and adapted for any lake or river in the  
United States.  
Our Perfect Revolving Spoon is undoubtedly the  
best general Spoon for taking fish ever offered to  
the public.

Three sizes made—No. 20 for bass, pike, pickerel,  
or any fish under five pounds weight; No. 21 for  
large fish, and the best spoon ever made for sal-  
mon trout; No. 22 excellent for deep water fishing.  
Beware of imitations. None genuine except JOHN  
H. MANN'S name stamped on every spoon.  
Sold wholesale and retail by the principal dealers  
in Fishing Tackle.

JOHN H. MANN & CO.,  
SYRACUSE, N. Y.

20,000 Sold the Second Year.  
THE BEST ADJUSTABLE BAG HOLDER  
In the World. PRICE ONLY \$1.50.

Sent free, on receipt of  
the price, anywhere in  
the United States.

Just the thing for the  
Farmer, Thresher, Mil-  
ler, the Feed Store,  
Grain, Potato, Guano  
and Phosphate dealers,  
Postmasters and Pub-  
lishers, and to all others  
who use Sacks or Bags.  
It is indispensable. A  
perfect and simple de-  
vice, made of iron, and  
will last a life time.  
Sold by the Hardware  
trade everywhere. Or-  
ders solicited. The plat-  
form is extra if wanted.  
Agents wanted every-  
where. Address  
L. JEFF. SPREngle,  
Sole Manufacturer,  
Ashland, Ohio.  
None can do without  
it for \$1.50. Send for a  
circular. Special dis-  
count to the trade.  
Will furnish a sample  
dozen to the trade dur-  
ing the month of January at the low price of \$3.

GEORGE W. BRUCE,  
1 Platt St., New York, Proprietor of the  
Atlantic Screw  
Works,  
And Agent for the  
Florence Tack Co. and  
C. A. Maynard

Maynard's C. S. Planters'  
Billings and Box Hoes;  
Brady's Crown, Planters' and  
Billings; Elwell's Weeding  
Planters and Grab, and a  
variety of other kinds for  
Home and Export Trade.

Established in 1859.

A. G. COES & CO.

WORCESTER,

MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw

Wrenches.

PATENTED,

May 2, 1871.

December 30, 1871.

December 28, 1875.

August 1, 1876.

The backstrain when the wrench is used is borne  
by the bar—not by the handle.  
The strongest Wrench made, and the only suc-  
cessful Re-enforced Bar.  
None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St.,  
New York, carry a full line of our goods, and will be  
pleased to serve you at factory prices.

STANDARD  
GIRARD WRENCH.  
WARRANTED.

FOR  
STRENGTH  
AND  
Durability  
IT HAS  
NO SUPERIOR.  
GUARANTEED  
IN  
EVERY RESPECT.  
Wrought Bar, Head  
and Screw.

Owing to the in-  
creased demand  
for these justly  
Popular Wrenches,  
we are now manu-  
facturing more than  
any other establish-  
ment in the world.

Our Wrench hav-  
ing been imitated by  
other manufactur-  
ers, we have adopt-  
ed the above Trade  
Mark, and will here-  
after stamp all our  
goods.

SEND FOR  
TERMS AND PRICES

GIRARD WRENCH MFG. CO., Girard, Pa.

LAMBERSON'S  
PRICE BOOKS.

Full Leather, \$7.50. Half Leather, \$6.50.  
Pocket Edition, Full Leather, \$3.50.  
Bolt List, \$1.00.  
Screw List, 50 cents.  
Revised April 27, 1881.

Address all orders to Pope & Stevens, General  
Agents, 114 Chambers Street, N. Y.  
For sale at publisher's prices by Wm. Blair & Co.,  
Chicago; A. F. Shaydel and Candell Hardware Co.,  
St. Louis; C. E. James, Detroit.

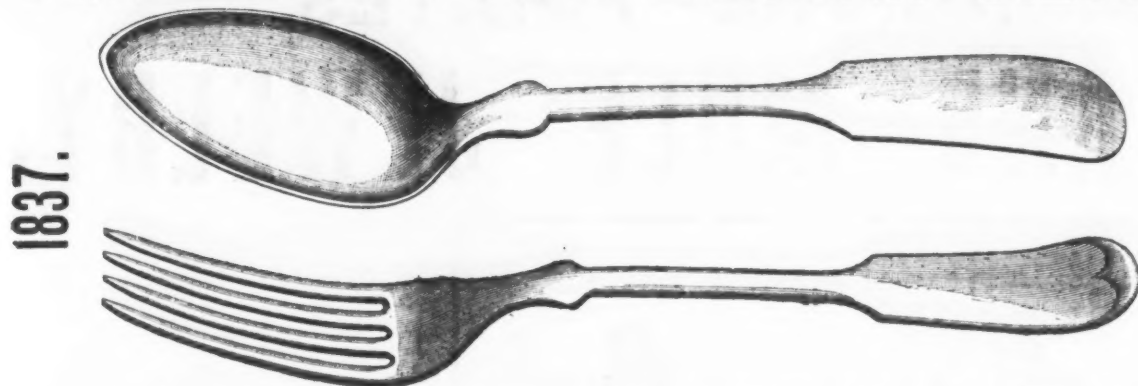
GEO. H. CREED,  
SHIP CHANDLERY,  
103 Reade Street, New York.  
Manufacturers of and Wholesale Dealers in  
Cotton and "Long Flax" Sail Duck,  
Cotton and Linen Havens,  
Creed's Patent Ships' Clews, Holman's Wire Rope  
Splicers, Agent for Raymond's American Crane Oil  
for lubricating Cylinders and Valves.

CHAS. E. LITTLE,  
59 Fulton St., New York,  
Pump-Log and Tubing Augers  
and Fittings,  
And Agent for  
Barnes' Wood-Working Machinery  
and Lathes.

Clements' Steam Band Saw.  
Kimball's Foot-Power Band Saw.



# HALL & ELTON'S GERMAN SILVER.



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO., Wallingford, Conn., and 75 Chambers St., New York.

## HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

## Finest Quality Silver-Plated Spoons, Forks, Knives, &c.



NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 18 per cent. Nickel Silver, and extra heavily plated with pure Silver. Our goods are all hand burnished, and are first-class in every respect. We pack our Spoons and Forks one dozen in each box.

49 CHAMBERS ST., NEW YORK. Factories, WATERBURY, CONN. 18 FEDERAL ST., BOSTON.

## Escutcheon Pins, Small Rivets and Screws,

And Specialties in this line made to order by

**BLAKE & JOHNSON,**  
WATERBURY, CONN.

## THE STANDARD WOOD TRACK HANGER OF AMERICA.

For Sale by the Wholesale Trade

Generally, or the

KIDDER SLIDE DOOR HANGER CO.

Sole Manufacturers,

ROMEO, MICHIGAN.



THE

## "KIDDER."

### PAT. SCREW SASH BALANCE,

An adjustable mechanical substitute for weights, doing away with the use of cords, pulleys, boxes, frames and the hanging and adjusting of weights to the weights of sashes, &c. Adapted to all sashes under 20 lbs. In weight, and costing applied, but about one-third the cost of applied weights. They are applied to the frame and work on the edges of the sash, the sashes working as with weights, by the pressure of the hand, without handling the balances, and are locked with the meeting rail lock. As they are not attached to the sash they can be readily removed for cleaning, &c. They have been in actual use nearly four years, with satisfaction, proved by their present large use, on their merits alone, demonstrated by sample sets originally ordered, as by traveling salesmen have been employed or orders personally solicited up to this time. The original patents covering the Screw Balance are dated April 8, 1871; renewed Sept. 2, 1873, and Jan. 5, 1875, and subsequent improvement patent, dated Nov. 6, 1877, all granted to me, the only authorized maker. All infringing handlers, users and makers of these goods will find themselves obligated for damages. For sale by the principal Hardware Dealers throughout the United States. Address orders to ROBERT B. HUGUNIN, sole authorized maker, Hartford, Conn., U. S. A.

### The New Measuring Instrument.

By simply passing it over a surface the exact distance in feet, inches and fractions is recorded on the dial. Supersees Rule and Tape. Measures Routes on Maps. Large ones in Brass cases, 100 ft. Miniature wheel measures, nickel, 10 ft. for watch pendulums.

JACKSON & TYLER,  
Baltimore, Md.



### THE BUCKEYE

Hand Drill Presses.

Both hand and Self-Feed.

Simple in Construction,

Efficient in Work,

and at much lower price than any other Drills made.

Send to us for circulars and prices. For sale by the trade. Address

The FOLGER MFG CO.,  
Springfield, O.



PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC

EVERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER.

NO MORTISING OR TENDING, CANNOT SAG OR WARP.

AND ANYONE CAN MAKE THEM. SEND FOR PRICE LIST.

New York: P. C. & G. GRAHAM & HAINES, 113 CHAMBERS ST.

Boston: W. P. PICKETT & SON, 124 LAKE ST.

Rebates 1/2 to 1/3 Price on 50

THE LAMONT PATENT

COMBINATION

RAZOR STROP.

FLAGLER, FORSYTH & BRADLEY, Agents, 298 Broadway, New York.

NOVELTY IRON FOUNDRY.

HAIGHT & CLARK, 16 & 18 De Witt St., Albany, N. Y.

Manufacturers of

FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.

Rosettes and Pickets for Wire Workers, Castings for Furniture and Piano Manufacturers. Iron and Metal Patterns of all kinds a Specialty.

Correspondence solicited for all kinds of castings.

plainly shows that the field is getting exhausted and is unprofitable to work. In Derbyshire, some twenty years ago, upward of 400,000 tons of stone were raised. Yet last year not one-half of that quantity was mined.

In the Bradford and Leeds districts the ore is worked in connection with the coal measures, and being most carefully selected, produces a good quality of iron. The ironstone found in connection with the coal has not only been greatly drawn upon, but it has in most localities been found to be unprofitable owing to its thinness. Even in South Wales, where in the lower measures the iron is found, as at Merthyr Tydvil and Taff Vale, it is only about 5 inches in thickness, so that a good deal of stone is imported from other districts, more especially Northamptonshire, while what hematite is raised in Cornwall and Devon is also sent to the iron works in South Wales. In Scotland the black band ironstone is met with in the carboniferous limestone soils, and is about 16 inches in thickness, and in some localities it is found to pass into the coal measures. What is known as the uppermost band is about 16 inches thick, but is now nearly all worked out. Indeed, in all English coal-mining districts but little iron is now being worked, owing to its thinness, inferiority in metallic iron and cost of raising, so that it may well be left out in the question of the duration of our iron ore fields, seeing that it could not pay to work such thin beds after the coal was got out. In the Silurian and Devonian systems hematites are found, more particularly in Devonshire and Cornwall, but are not likely to be taken into consideration in forming an estimate as to how long the largest ironstone fields will last. It is different, however, as regards the hematites of Cumberland and Lancashire, which are both being industriously worked. They are found in the carboniferous or mountain limestone and are most valuable, but they are somewhat limited in area, so that there would not be much difficulty in calculating how long they are likely to last at the present rate of production. It is, therefore, evident that the greatest dependence as to the future must be placed on the fields of iron ore that have been discovered within little more than thirty years from the present time, and these consist of Cleveland, Northamptonshire and Lincolnshire, and the new field about to be developed in the county of Rutland. As to the former, which produces nearly one-half of the ore raised in the kingdom, its life will be a tolerably long one, and will last longer than the coal in the districts contiguous to and with which it is smelted. Mr. I. Lowthian Bell, a very high authority on the iron and coal trades of Cleveland and Durham, in evidence given before the Select Committee on Coal, said he had made a calculation that it would take the whole of the coal of the counties of Northumberland and Durham to smelt the ironstone in the Cleveland hills—that is, supposing all were used for making iron.

Taking the quantity of available coal in Durham and Newcastle at 7,000,000,000 tons, it may fairly be assumed that the ironstone would amount to upward of 15,000,000,000 tons. The coal, according to the present rate of increase, would not last much more than 200 years, while the ironstone, at the existing rate of production, would not be finished at the end of 700 years. When the coal is exhausted there will not be much inducement for the works to be carried on where they are now. Supplies of coal, however, may be brought from a distance to take the place of what was previously supplied close at hand. The Northamptonshire field is a most extensive and an almost inexhaustible one, traversing, as it does, a large portion of the county, commencing on the Midland system near to Market Harborough, and proceeding on to the town of Northampton, and from there to Blisworth and Weedon and beyond for several miles. It is also found to the east of the Midland at Thrapstone, and other places on the London and Northwestern, and from there runs on to the county of Rutland. Already the ironmasters of Derbyshire, Notts, and in some parts of the West Riding, receive vast quantities of stone from Northamptonshire, so that but little of the local stone is used in making iron. Lincolnshire, the most recently discovered ironstone field, now supplies several of the coal districts where ironstone was formerly extensively worked, but now only on a small scale. It will be seen that the ironstone formerly worked so largely in most coal-mining localities for the furnaces near at hand are now not thought of, being, as a rule, rather inferior in quality, and very thin, generally under 1 foot. On the other hand, the Cleveland stone is of considerable thickness, while in Northamptonshire, where most of the ore is raised quite close to the surface, there are two beds, the top one being 12 feet thick, separated by 10 or 15 feet of an ochreous substance from the lower one, which is 20 feet thick. In Lincolnshire some of the stone is upward of 18 feet in thickness, and the beds traverse a large area of ground from Frodinham to Lincoln and beyond, and a good deal of the ore is sent to Staffordshire, and the West Riding of Yorkshire, and Derbyshire. It will be seen that the vast stores of ironstone now being raised in the collieries are those that will have to be the resort of nearly all English ironmasters in no distant future, as it is evident that the stone of the coal measures is fast dying out by exhaustion and unprofitableness in working. With the increasing consumption of stone, it is a problem not easily solved as to how long seams of it will last; but there is no doubt they will last longer than the beds of coal which are necessary for the smelting of them, so that the exhaustion of the coal fields will in all probability lead to the termination of the manufacture of iron on anything like a large scale, unless it can be made without coal.

Covering Boilers with Silk.—It is well known that silk is an excellent non-conductor of heat, and some recent experiments in Germany would seem to indicate that it might pay to encase boilers in this costly material. In one trial three boilers of the same size and make were ranged in order, one covered with the ordinary felt, another with a coating of silk only five-eighths of the thickness of the felt, while the third was left altogether uncovered. They were all filled with water having a temperature of 100° C., and examined at intervals. After a lapse of three

hours it was found that the unprotected boiler had lost 12° of heat, and the other two each 2°. After a further lapse of 33 hours, the felt-covered boiler had lost 13½°, and that covered with silk only 14°, so that there was no appreciable difference between the protective powers of the silk and those of a casing of felt nearly twice its thickness. With regard to the cost of the material, it is said that in all the silk manufactories there are waste scraps which it would be difficult or impossible to utilize in the trade. These can, it is asserted, be made up into bands and rolls, costing comparatively little, and sold at a profit to the makers and users of boilers. As to the lasting and wearing powers of silk as compared with felt nothing is said, and there has not, perhaps, been time to apply an adequate test; but it is at least possible that in this respect the finer substance may possess great advantages over the coarser and cheaper.

### Inter-State Commerce.

Among the important measures which will be early presented for the consideration of Congress is the Inter-State Commerce Bill, which bears the name of Mr. Reagan, of Texas. Mr. Reagan says that he became a member of this Congress chiefly for the purpose of urging his bill relating to this subject. He has already reintroduced his Inter-State Commerce Bill, and its counterpart has been introduced in the Senate by Mr. Coke, of Texas. The fundamental provisions of Mr. Reagan's bill are, first, that the constitutional interpretation of "commerce" includes inter-State traffic, and that while freights and passengers transported within the State are solely under the control of the laws passed by State Legislatures, freights, passengers, &c., which are received in one State to be delivered in another, are subject to regulations prescribed by Congress. The bill is long and explicit as to the manner in which the authority over inter-State traffic, which it asserts exists in Congress, should be exercised.

Though several members of the House Committee on Commerce are known to be favorable to the bill, it is sure to encounter strong opposition. Judge Reagan gives his personal views as follows: "The provisions of the bill are about the same as those in the bill reported to the last Congress, with the exception that in the first section the present bill provides that all charges shall be reasonable. The object of introducing this provision is to compel reasonable charges, under the liabilities and penalties that apply to other violations of the law. Again, in the seventh section of the bill a change is made so that the civil suits which individuals are authorized to bring may be brought in any court of competent jurisdiction. They are thus enabled to bring such suits in the State courts, which are more convenient to the people and more agreeable. The *qui tam* actions and the criminal proceedings will have to be in the Federal courts, and there is added to this section a requirement that the district attorneys of the United States shall prosecute the *qui tam* actions either upon their motion or upon the affidavit of respectable citizens. I am very anxious to get the bill considered by the present Congress, and regard it as altogether the most important measure before Congress, and I regard it further as assured that if the railroad men were wise they would not oppose it, because it is altogether conservative in its character, simply looking to the protection of the interests of the people by restraining the undue exercise of the monopoly powers of these corporations, and in no way interferes with the just management of these roads. That is the truth about the bill. There has been much effort used to show the contrary, but my judgment is that if the opponents of the bill prevent reasonable legislation of this kind the time will come when they may expect legislation of a much more radical character, for it cannot be possible that 50,000,000 of American people will turn their commerce over to the indiscriminating and uncontrolled license of corporations. I have given a great deal of attention to this question for the last five years, and I can say that but for some hope of receiving favorable action on this bill I should not have wanted to come back to Congress at all. There have been more petitions sent to Congress for the passage of this measure, I take it, than any measure in the history of the Government—perhaps two or three times as many—and they have come from every State in the Union. I have myself received hundreds, and I think I might say thousands, of letters from people in all parts of the Union, embracing many of the first men in the country. The opposition to the passage of the bill is not limited to any one party. It has come mainly from those who represent the interests of railroad corporations. The bill passed the House of Representatives in the Forty-fifth Congress by 35 majority, and I think if we could have got it before the House last Congress we could have passed it by 75 majority."

Prevention of Overwinding.—The prevention of accidents in mines and collieries arising from what is known as "overwinding," has from time to time received a great deal of attention from colliery managers and engineers. A new process for this purpose was brought into operation some time ago at the Lingdale mines, near Guisborough, England. The apparatus there in use is one designed and patented by Messrs. Charles I. Anson, Son & Co., of Darlington, and is upon the principle of admitting steam automatically to a powerful steam brake, and at the same time cutting it off from the engine cylinders, by the release of a lock which is struck by the ascending cage immediately on its passing the point of safety. Although this apparatus has been in operation only a few months, it has been instrumental in averting a possible accident upon more than one occasion.

M. Mouchez, director of the Observatoire in Paris, is making arrangements for taking meteorological observations at an elevation of 2300 meters, by means of a captive balloon. The balloon will be charged with ordinary coal gas. These observations are intended to facilitate the calculation of atmospheric refractions.



# THE "TERROR" AMONG THE "PIRATES." COVERT'S HORSE AND MULE JEWELRY.



CONSISTING OF

Covert's Celebrated Harness Snaps, Swivel Snaps, Open Eye Bit and Chain Snaps, Snap and Thimble for Horse and Cattle Ties. Rope Goods, consisting of Rope Halters, Horse and Cattle Ties, Halter Leads, Driving Reins, Weight Cords, Hitching Cords, Lariat-tethers and Picket Pins. Also, Leather Horse Ties, Breast Chains, Halter Chains, Martingale Chains, Rein Chains, Post Chains, Post Rods, &c.

For sale by all leading jobbers in general and saddlery hardware, and the same discounts given from the list to the trade as when purchased direct from the factory.

For illustrated catalogue and price list address,

## COVERT MANUFACTURING CO., Sole Manufacturers, West Troy, N. Y.



We have invented a new style of Knife Handle, and applied for a patent on same. It is light, exceedingly strong, and can never get loose. We have plated this knife with a composition plate, and we warrant it to wear as long as the VERY BEST silver plate, and to look as well after two months' use. The price is so extremely low that the poor need scour knives no longer. We have for three years warranted our Butcher Knives to be superior to any other Butcher Knives on earth, and this warranty has never been disputed to our knowledge by anybody who has ever tried them, and our statement about these knives will prove equally reliable. We will send 12 knives and 12 forks by mail, postpaid, on receipt of \$3. We make a very handsome Butter Knife, heavily plated with silver, at an exceedingly low price. We also make a full line of Hot Water Proof Table Cutlery, which has very rapidly gained in popularity for the past three years, and is having an unprecedented sale at the present time. We make eleven different styles of Carvers. The cutting quality of the blade is the same as that of our Butcher Knives. The fork guard is patented by us, and made by nobody else, and is highly admired by the trade. We are having a large sale now, but we desire to increase it. Give us a chance to prove our statements.

**GOODELL COMPANY, Antrim, N. H.**

## DROP PRESSES.

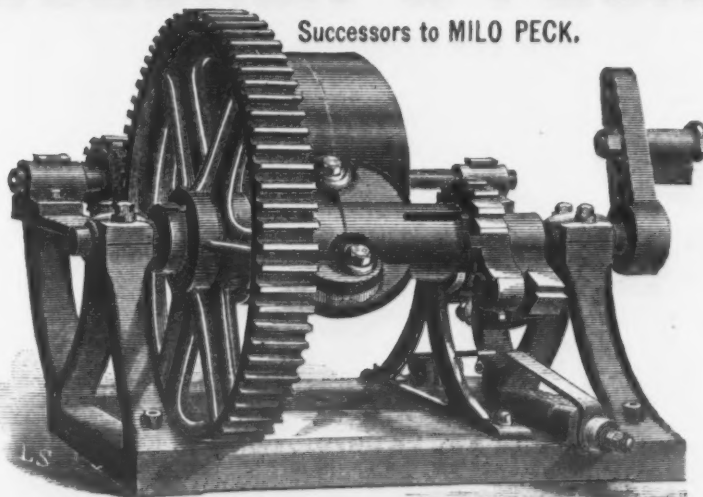
The Peck Patent Drop Press is the most simple, durable and efficient HAMMER made, both for Stamping Sheet Metals and for forging, and takes less power than any other.

P. O. Address:

Box 122,  
NEW HAVEN, CONN.

## BEECHER & PECK,

Successors to MILO PECK.



Latest Improved Peck Lifter.

## DROP FORGINGS.

Our Forging Department is fitted out with the latest first-class Tools, and we are now prepared to quote figures on anything in the drop forging line, doing nothing but first-class work.

Works:

Cor. Lloyd and River Streets,  
GRAPEVINE POINT.



# DE-OXYDIZED BRONZE.

**DE-OXYDIZED BRONZE** (patented) is an alloy of **LAKE COPPER** and best **ASIATIC TIN** in any proportion required, so as to be either as ductile as copper, as tough as iron, or as hard as steel, according to the proportion of Copper and Tin used.

The process of making the alloy is what constitutes its superiority over any other known alloy of Copper and Tin or any other Bronze composition. The castings made from this metal, owing to its perfect fluidity when melted, possess great density, perfect soundness and homogeneity. Unlike certain bronze and other compositions, it can be handled without the least difficulty by any ordinary founder, as it flows like oil in pouring.

Thus the necessity and trouble of shipping patterns, the delay in receiving castings and the expense of the double charges of freight or express, such as attend the obtaining, in many cases, of Phosphor Bronze, are entirely avoided by ordering **D. O. B. in ingots**. Where this metal has superseded other compositions of similar character, it has endured three times as long. In a word, we claim that **De-Oxydized Bronze** not only has none of the objectionable features attributed to similar compositions, but that it possesses all their good qualities in addition to its own merits, and advantages peculiar to itself, such as the following summary will make clear:

1. **ITS GREAT CONVENIENCE IN HANDLING** as compared to Phosphor Bronze.
2. We claim for it **SUPERIOR ANTI-FRICTION QUALITIES** to any other known Brass or Bronze.
3. **GREAT MALLEABILITY AND TENACITY.**
4. Its homogeneousness and smoothness of surface render it capable of the **HIGHEST POLISH.**
5. As before mentioned, we claim for it **UNEQUALED ENDURANCE.**
6. We claim that **JOURNALS MADE of D. O. B. REQUIRE ONE-FOURTH LESS LUBRICATING MATERIAL** than any other composition yet known.

Finally, this metal has never failed to give more than satisfaction wherever used. To sustain our statements, the following testimonials will suffice:

**Henry Disston & Sons, Saw, Tool, Steel and File Works, Front and Laurel Streets, Philadelphia Smelting Company, City:**

PHILADELPHIA, October 4, 1879.  
GENTLEMEN: After a trial of eighteen months of your "DE-OXYDIZED BRONZE" as Journal Boxes in our Rolling Mill, where great pressure is required we take pleasure in recommending it as being superior to any we have heretofore used. Very truly,  
**HENRY DISSTON & SONS.**

**Office of Eagle Iron Works, 1162 North Third Street,**

Philadelphia Smelting Company:

PHILADELPHIA, August 29, 1879.  
GENTLEMEN: In reply to yours of the 28th inst., we beg to say that we have been using your "DE-OXYDIZED BRONZE" for over a year, and have found it better than any composition boxes we have used; and as long as

you continue to make it the same quality, we shall use no other metal in our Engine Boxes. We therefore take pleasure in recommending it to Engine Builders in general.

Yours respectfully,

**HOFF, FONTAINE & ABBOTT.**

**Office of Union Brass Manufacturing Company,**

CHICAGO, Dec. 23, 1880.

Philadelphia Smelting Company, Limited, Twelfth and Noble Streets, Philadelphia, Pa.

DEAR SIR: In reply to your inquiry of yesterday as to our opinion of "DE-OXYDIZED BRONZE" for Railway Coach Trimmings, I beg to submit that we have used it up to present writing for the trimming of something over 100 coaches. One marked peculiarity of this metal, when highly finished, is non-liability to abrasion, and its non-affinity with the gases of the atmosphere, which in embossed work is a great desideratum. To those willing to pay more in the first cost, we would confidently recommend "DE-OXYDIZED BRONZE" Trimmings as cheaper in the end.  
Yours very truly,  
**J. HALL DOW, President.**

This metal is used for the following purposes, and we can refer to large concerns in addition to above, through the New England and Middle and Western States, who are using it in preference to any other.

1. **Engine, Car and Machinery Journals.**
2. **Pumps, Valves and Linings, Cylinders, Pinions, Cogs, Plungers, Crank Pins, &c.**

3. **Car Trimmings, Harness and Coach Furniture, House Hardware, Steam Fittings, &c.**
4. **Wire, Sheets, Rods and Tubes.**

And for any other purpose that a handsome, durable and sound Bronze is required. We especially commend it to **Railroad Companies, Car Builders, Machinists, Engineers** and others requiring a **Journal Metal** that will stand the severest friction and the heaviest pressure.

Manufactured and for sale in Ingots and Castings by the

**PHILADELPHIA SMELTING COMPANY, Limited,**

S. E. COR. TWELFTH AND NOBLE STS., PHILADELPHIA, PA., U. S. A.

## GENUINE BABBITT.

Our Genuine Babbitt is superior to all other makes in the market in every particular. We guarantee it to be perfect in its Anti-friction qualities in machinery **AT A SPEED OF 10,000 PER MINUTE**, or at **1000 TONS PRESSURE** for **10 YEARS**. We append below testimonials from 41 houses justifying us in the above claims.

WORCESTER, MASS., April 21, 1881.  
We have used your "Genuine Babbitt" about 4 years on our wood cutting machinery bearings, run at a speed of 9800 revolutions per minute, and all ways with entire satisfaction.  
**G. W. INGALLS & CO.**

NEW HAVEN, CONN., April 11, 1881.  
We have used your "Genuine Babbitt" in our Challenge Rock Breaker with excellent results, and are pleased to testify to its merits for Journals,  
**JAMES BUTTERWORTH & SON.**

where high speed and great pressure are required.

**Office JAMES BUTTERWORTH & SON, Manufacturers of Woolen Machinery, 258, 254 and 250 E. Adams St., PHILA., Oct. 17, 1881.**  
PHILADELPHIA SMELTING COMPANY.—Gentlemen: We have been running your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 5000 revolutions per minute, without renewal. We have found it to be the best metal we ever used. Yours truly,  
**JAMES BUTTERWORTH & SON.**

WORCESTER, MASS., April 23, 1881.

Having used your "Genuine Babbitt Metal" for over 4 years on machinery that runs over 5000 turns a minute, on 1 in. shaft, 3 in. Journals, I can safely recommend it for all you advertise it to do. Any person wishing to see the machinery or wanting further information can call or address,  
**A. I. THOMPSON, Master Mechanic, 25 Hermon street.**

From J. L. MARSDEN, Supt., FARRELL FOUNDRY AND MACHINE CO., ANSONIA, CONN., Aug. 17, 1880.

The "Genuine Babbitt" we have bought from you gives perfect satisfaction in our Stone Breakers. We have it working in bearings 12 in. long and 5 in. diameter. One-half the revolution of shaft there is a pressure of 500 tons. The other half 2 1/2 tons. The shaft makes from 200 to 250 turns per minute. I think this is a very severe test, yet they have been running for more than one year.

From WITHERBY, RUGG & RICHARDSON, Manufacturers of Wood-Working Machinery, WORCESTER, MASS., Nov. 20, 1880.

Send us 1000 pounds "Genuine Babbitt," divided into Bars, as usual. We think the continuance of our trade with you, in the face of the constant effort made by other parties to divert our patronage, is a sufficient recommendation of your goods. We speed some Journals as high as 5000. Yours truly,  
**WITHERBY, RUGG & RICHARDSON.**

From this it will be seen that it can have no superior, or even equal, as an Anti-Friction Metal in anything manufactured. We make besides all grades of Anti-Friction Metals,

Letter A, Guaranteed at a speed of 2000.  
Letter D, Used for Shafting.

Letter B, Guaranteed at a speed of 1000.  
Letter E, Used for Ag'l Implements' &c.

Letter C, Guaranteed at a speed of 800.  
Letter A L, For slow speed.

All our Metals are made from best Lake Copper, Asiatic Tin, Cookson's Antimony and best Refined Lead, and in all cases run free at melting heat, without drossing, and without any necessity for heating the journals into which they are poured.

## MANUFACTURERS' AND MACHINISTS' NAME PLATES, REAL BRONZE, FINISHED.

Patterns from \$3 upwards, according to Size and Style. Plates, \$3 per dozen and upward, according to Size and Style.

SKETCHES FURNISHED FOR APPROVAL BEFORE MAKING PATTERNS.

We have a specialty in this line and produce a handsomer plate, at less money, than can be obtained elsewhere.

**ART AND ECCLESIASTICAL METAL WORK IN BRASS AND BRONZE,**

**GAS FIXTURES, ALTAR CANDLESTICKS, SANCTUARY LAMPS, CHANCEL RAILS, PULPITS, &c.**

**PHILADELPHIA SMELTING COMPANY, Limited,**

S. E. COR. TWELFTH AND NOBLE STREETS, PHILADELPHIA, PA.







## Special Notices.

## Second-Hand &amp; New Machinists' Tools.

JANUARY 3, 1882.

One Car Axle Lathe, 36 in. x 12 ft. At order.

One Engine Lathe, 30 in. x 12 ft. At order.

One Engine Lathe, 28 in. x 12 ft. At order.

One Engine Lathe, 26 in. x 12 ft. At order.

One Engine Lathe, 24 in. x 12 ft. At order.

One Engine Lathe, 22 in. x 12 ft. At order.

One Engine Lathe, 20 in. x 12 ft. At order.

One Engine Lathe, 18 in. x 12 ft. At order.

One Engine Lathe, 16 in. x 12 ft. At order.

One Engine Lathe, 14 in. x 12 ft. At order.

One Engine Lathe, 12 in. x 12 ft. At order.

One Engine Lathe, 10 in. x 12 ft. At order.

One Engine Lathe, 8 in. x 12 ft. At order.

One Engine Lathe, 6 in. x 12 ft. At order.

One Engine Lathe, 4 in. x 12 ft. At order.

One Engine Lathe, 3 in. x 12 ft. At order.

One Engine Lathe, 2 in. x 12 ft. At order.

One Engine Lathe, 1 in. x 12 ft. At order.

One Engine Lathe, 1/2 in. x 12 ft. At order.

One Engine Lathe, 1/4 in. x 12 ft. At order.

One Engine Lathe, 1/8 in. x 12 ft. At order.

One Engine Lathe, 1/16 in. x 12 ft. At order.

One Engine Lathe, 1/32 in. x 12 ft. At order.

One Engine Lathe, 1/64 in. x 12 ft. At order.

One Engine Lathe, 1/128 in. x 12 ft. At order.

One Engine Lathe, 1/256 in. x 12 ft. At order.

One Engine Lathe, 1/512 in. x 12 ft. At order.

One Engine Lathe, 1/1024 in. x 12 ft. At order.

One Engine Lathe, 1/2048 in. x 12 ft. At order.

One Engine Lathe, 1/4096 in. x 12 ft. At order.

One Engine Lathe, 1/8192 in. x 12 ft. At order.

One Engine Lathe, 1/16384 in. x 12 ft. At order.

One Engine Lathe, 1/32768 in. x 12 ft. At order.

One Engine Lathe, 1/65536 in. x 12 ft. At order.

One Engine Lathe, 1/131072 in. x 12 ft. At order.

One Engine Lathe, 1/262144 in. x 12 ft. At order.

One Engine Lathe, 1/524288 in. x 12 ft. At order.

One Engine Lathe, 1/1048576 in. x 12 ft. At order.

One Engine Lathe, 1/2097152 in. x 12 ft. At order.

One Engine Lathe, 1/4194304 in. x 12 ft. At order.

One Engine Lathe, 1/8388608 in. x 12 ft. At order.

One Engine Lathe, 1/16777216 in. x 12 ft. At order.

One Engine Lathe, 1/33554432 in. x 12 ft. At order.

One Engine Lathe, 1/67108864 in. x 12 ft. At order.

One Engine Lathe, 1/134217728 in. x 12 ft. At order.

One Engine Lathe, 1/268435456 in. x 12 ft. At order.

One Engine Lathe, 1/536870912 in. x 12 ft. At order.

One Engine Lathe, 1/1073741824 in. x 12 ft. At order.

One Engine Lathe, 1/2147483648 in. x 12 ft. At order.

One Engine Lathe, 1/4294967296 in. x 12 ft. At order.

One Engine Lathe, 1/8589934592 in. x 12 ft. At order.

One Engine Lathe, 1/17179869184 in. x 12 ft. At order.

One Engine Lathe, 1/34359738368 in. x 12 ft. At order.

One Engine Lathe, 1/68719476736 in. x 12 ft. At order.

One Engine Lathe, 1/137438953472 in. x 12 ft. At order.

One Engine Lathe, 1/274877906944 in. x 12 ft. At order.

One Engine Lathe, 1/549755813888 in. x 12 ft. At order.

One Engine Lathe, 1/1099511627776 in. x 12 ft. At order.

One Engine Lathe, 1/2199023255552 in. x 12 ft. At order.

One Engine Lathe, 1/4398046511104 in. x 12 ft. At order.

One Engine Lathe, 1/8796093022208 in. x 12 ft. At order.

One Engine Lathe, 1/17592186044416 in. x 12 ft. At order.

One Engine Lathe, 1/35184372088832 in. x 12 ft. At order.

One Engine Lathe, 1/70368744177664 in. x 12 ft. At order.

One Engine Lathe, 1/140737482355328 in. x 12 ft. At order.

One Engine Lathe, 1/281474964710656 in. x 12 ft. At order.

One Engine Lathe, 1/562949929421312 in. x 12 ft. At order.

One Engine Lathe, 1/1125899858842624 in. x 12 ft. At order.

One Engine Lathe, 1/2251799717685248 in. x 12 ft. At order.

One Engine Lathe, 1/4503599435370496 in. x 12 ft. At order.

One Engine Lathe, 1/9007198870740992 in. x 12 ft. At order.

One Engine Lathe, 1/18014397741481984 in. x 12 ft. At order.

One Engine Lathe, 1/36028795482963968 in. x 12 ft. At order.

One Engine Lathe, 1/72057590965927936 in. x 12 ft. At order.

One Engine Lathe, 1/144115181931855872 in. x 12 ft. At order.

One Engine Lathe, 1/288230363863711744 in. x 12 ft. At order.

One Engine Lathe, 1/576460727727423488 in. x 12 ft. At order.

One Engine Lathe, 1/1152921455454846976 in. x 12 ft. At order.

One Engine Lathe, 1/2305842910909693952 in. x 12 ft. At order.

One Engine Lathe, 1/4611685821819387904 in. x 12 ft. At order.

One Engine Lathe, 1/9223371643638775808 in. x 12 ft. At order.

One Engine Lathe, 1/18446743277277551616 in. x 12 ft. At order.

One Engine Lathe, 1/36893486554555103232 in. x 12 ft. At order.

One Engine Lathe, 1/73786973109110206464 in. x 12 ft. At order.

One Engine Lathe, 1/147573946218220412928 in. x 12 ft. At order.

One Engine Lathe, 1/295147892436440825856 in. x 12 ft. At order.

One Engine Lathe, 1/590295784872881651712 in. x 12 ft. At order.

One Engine Lathe, 1/1180591569745763303424 in. x 12 ft. At order.

One Engine Lathe, 1/2361183139491526606848 in. x 12 ft. At order.

One Engine Lathe, 1/4722366278983053213696 in. x 12 ft. At order.

One Engine Lathe, 1/9444732557966106427392 in. x 12 ft. At order.

One Engine Lathe, 1/18889465119332212854784 in. x 12 ft. At order.

One Engine Lathe, 1/37778930238664425709568 in. x 12 ft. At order.

One Engine Lathe, 1/75557860477328851419136 in. x 12 ft. At order.

One Engine Lathe, 1/151115720954657702838272 in. x 12 ft. At order.

One Engine Lathe, 1/302231441909315405676544 in. x 12 ft. At order.

One Engine Lathe, 1/604462883818630811353088 in. x 12 ft. At order.

One Engine Lathe, 1/1208925767637261622706176 in. x 12 ft. At order.

## Trade Report.

Office of THE IRON AGE.

WEDNESDAY EVENING, JAN. 4, 1882.

The improvement noticed in Wall street

markets early in the week, following closely

on a period of depression, led many to anticipate

a boom after the turn of the year, but such

expectations have not been realized. Values

have declined and a large short interest

been created, but by Friday afternoon the

latter had been partially closed out, making

another bear raid possible, and the opportunity

was not allowed to pass unimproved. The

active money market, natural to the close

of the year, and the severe cutting of rates

for railway transportation from the West

(which were lower than ever before), favored

the demonstration. The consequence was a

weak market on Saturday and Tuesday,

much to the surprise of the street generally.

The decline on Tuesday ranged anywhere

from 2 to 3 per cent., the falling off being

most noticeable in the Trunk Line shares,

Denver, the Wabashes and other Southwesterns.

It was reasoned that corporations, no more than individuals, can

afford to do business at a loss, and that the

continuance of the "railroad war" augers

poorly for future dividends. According to the

Chicago Tribune, the Vanderbilt road and the

Grand Trunk last week took grain and provisions

as low as 10¢ per 100 lb between Chicago and

New York. To-day the stock market opened

under increased depression, with considerable

orders to sell, but in the last hours there was

a marked reaction and prices advanced 1/4

for Lake Shore to 112 1/2, and 1/2 % for the

remainder of the list. Call loans fell to

plain 6 %.

In commercial circles the general situation

of business is considered healthy, aside from

the speculative tendencies which pervade many

departments. Fortunately we can except from

this latter indictment the industrial and

manufacturing branches, respecting which

there are no signs of lessened activity in

any direction.

This afternoon extended 3 1/2 % bonds

included in the 105th and 106th calls were

presented to the Treasury for redemption to

the amount of \$1,368,005, making the total

presented for redemption to-day \$1,449,005.

United States bonds were strong throughout

most of the week.

The leading drawers of foreign exchange

advanced their posted rates on Friday to

\$4.81 for 60-day and \$4.85 for sight, at

which they remain, with actual rates slightly

lower than at the close of last year.

State stocks were dull and irregular

through most of the week, but for the last

day or two have been unusually active.

The exports of domestic produce from this

port for the week ending last night amount

to \$6,395,000. The tenor of foreign advices

of late has somewhat improved.

The bank return for the week shows a loss

of \$291,400 in reserve, which now stands at

\$1,251,900 above, against \$2,727,775 above

at this time last year. The loans show a gain

of \$1,979,300.

The importations of specie and bullion at

this port during the week ending December

30 were \$153,682, consisting of \$114,749 in

gold, and \$38,933 in silver, as against a total

of \$2,637,411 for the week ending December

31 last year. The importations since the 1st

of January and since the 1st of August com-

pare as follows with the movement during

the corresponding periods last year:

	Since January 1, 1881.	1882.
Gold.....	\$53,270,355	\$60,094,356
Silver.....	2,793,187	5,656,836
Total.....	\$56,063,542	\$65,751,192

	Since August 1, 1881.	1882.
Gold.....	\$24,545,995	\$67,110,880
Silver.....	1,039,258	2,464,310
Total.....	\$25,585,254	\$69,575,190

Government bonds at the close were strong,

but 1/4 % lower than at the close yesterday

for the extended bonds; as follows:

	Bid.	Asked.
U. S. 4 1/2 % 1881 registered.....	114 1/2	115 1/2
U. S. 4 1/2 % 1881 coupon.....	114 1/2	115 1/2
U. S. 4 1/2 % 1882 registered.....	114 1/2	115 1/2
U. S. 4 1/2 % 1882 coupon.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1880.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1881.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1882.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1883.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1884.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1885.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1886.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1887.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1888.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1889.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1890.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1891.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1892.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1893.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1894.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1895.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1896.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1897.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1898.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1899.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1900.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1901.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1902.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1903.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1904.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1905.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1906.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1907.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1908.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1909.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1910.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1911.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1912.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1913.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1914.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1915.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1916.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1917.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1918.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1919.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1920.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1921.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1922.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1923.....	114 1/2	115 1/2
U. S. Currency 6 1/2 % 1924.....		







Hardware.....	18	2,890
Iron, hoop, tons.....	20	812
Iron, pig, tons.....	609	14,447
Iron, sheet, tons.....	104	5,620
Iron, ore, tons.....	1,957	4,151
Iron, other, tons.....	953	37,576
Lead, pigs.....	781	3,401
Machinery.....	122	16,216
Metal goods.....	182	19,392
Nails.....	57	1,249
Needles.....	20	5,609
Old metal.....	1	200
Platina.....	1	2,176
Plated ware.....	1	53
Saddlery.....	8	1,124
Steel.....	59,031	221,522
Spelter.....	531,072	21,210
Silverware.....	8	517
Tin, boxes.....	49,537	182,876
Tin, 1,497 slabs, 168,058 lbs.....	38,927	3,927
Wire.....	37	4,684
Zinc.....	77,060	3,568

The following are the imports of leading articles, compared with previous dates:

	For the week.	52 weeks.	Same time 1881.
Cutlery, pkgs.....	172	6,848	8,466
Hardware, pkgs.....	18	973	1,215
Iron, R. R., tons.....	351,253	580,600	580,600
Lead, pigs.....	781	42,200	42,200
Steel, pkgs.....	59,031	1,281,245	606,849
Tin, boxes.....	49,537	1,281,245	1,671,605
Tin slabs, lbs.....	10,095	19,242,911	26,254,275

## EXPORTS, EXCLUSIVE OF SPECIAL.

For the week ended Dec. 27:

Total.....	\$8,554,865	\$7,932,224	\$6,413,132
Prev. reported.....	337,953,009	308,139,461	366,040,747

Since Jan. 1.....\$346,507,874 \$406,077,885 \$370,653,879

## EXPORTS OF SPECIAL.

For the week ended Dec. 31:

Dec. 29—Steamer Westphalia, Paris—American silver bars.....	\$54,000
French silver coin.....	5,500
Dec. 31—Steamer Germanic, London and Liverpool—American silver bars.....	145,000
Mexican silver dollars.....	65,000
Total for the week.....	\$272,500
Previously reported.....	11,092,419
Total since January 1, 1881.....	\$11,335,949

## EXPORTS

Hamburg.	Quan.	Val.	Quan.	Val.
Mach'y, cs.....	24	\$5,000	47	\$4,275
Hdw., cs.....	62	1,728	50	995
Mf. iron, pkgs.....	117	6,000	13	69
Brass, cs.....	9	24	1	430
Nails, bxs.....	2	43	16	481
Guns, cs.....	2	35	249	864
Hdw., cs.....	2	35	78	508
Spelter, slabs.....	3,287	10,080		
Ag. imp, pkgs.....	166	40,000		
Sew. ma., cs.....	723	9,972		
Guns, cs.....	16	310		
Type wr., cs.....	6	170		
Clocks, bxs.....	19	420		

Bremen.	Quan.	Val.	Quan.	Val.
Plum., gals.....	492,669	45,793		
Ag. imp, pkgs.....	50	1,550		
Hdw., pkgs.....	54	1,488		
Wringers, cs.....	20	580		
Mf. iron, pkgs.....	4	101		

Rotterdam.	Quan.	Val.	Quan.	Val.
Pumps, pkgs.....	16	1,059		
Hdw., cs.....	24	947		
Wringers.....	32	1,290		
Ag. imp, pkgs.....	7	284		
Clocks, bxs.....	24	515		
Plum., gals.....	291,437	23,155		
Mf. iron, pkgs.....	45	2,451		
W. mills, pkgs.....	18	1,200		

Antwerp.	Quan.	Val.	Quan.	Val.
Mf. iron, pkgs.....	13	201		
Mach'y, cs.....	8	800		
Plum., gals.....	359,920	26,992		
Mf. metal, cs.....	2	40		
I. R. gds, cs.....	3	100		
Hdw., cs.....	23	624		
Ag. imp, pkgs.....	24	1,009		
Sew. ma., cs.....	18	1,070		

Dutch West Indies.	Quan.	Val.	Quan.	Val.
Hdw., cs.....	5	65		
Nails, bxs.....	10	42		
Plum., gals.....	29,993	310		
Mf. iron, pkgs.....	9	50		
Sew. ma., cs.....	3	53		
Nails, kegs.....	12	46		
Clocks, bxs.....	7	92		

Dutch East Indies.	Quan.	Val.	Quan.	Val.
Plum., gals.....	240,000	26,400		

Liverpool.	Quan.	Val.	Quan.	Val.
Clocks, bxs.....	227	3,709		
Mach'y, cs.....	60	3,813		
Hdw., cs.....	63	3,317		
Revolvers, cs.....	1	790		
Pumps, pkgs.....	3	405		
Rifles, cs.....	2	718		
Mf. iron, pkgs.....	5	425		

Bristol.	Quan.	Val.	Quan.	Val.
Clocks, cs.....	89	1,186		

London.	Quan.	Val.	Quan.	Val.
Plum., gals.....	174,985	13,000		
Hdw., cs.....	47	1,372		
W. gds, cs.....	40	1,372		
Tacks, cs.....	6	159		
Plum., gals.....	730	13,400		
Tin, slabs.....	730	13,400		
Mach'y, cs.....	55	4,475		
Sew. ma., cs.....	20	820		
Revolvers, cs.....	1	69		
Mf. iron, pkgs.....	1	50		
I. R. gds, cs.....	3	45		

Glasgow.	Quan.	Val.	Quan.	Val.
Clocks, cs.....	20	604		
Shears, cs.....	1	116		
Ag. imp, pkgs.....	4	250		
Hdw., cs.....	17	400		

Cork.	Quan.	Val.	Quan.	Val.
Plum., gals.....	143,614	11,488		

British North American Colonies.	Quan.	Val.	Quan.	Val.
Hdw., cs.....	3	66		
Pig iron, tons.....	50	750		

British West Indies.	Quan.	Val.	Quan.	Val.
Hdw., cs.....	6	41		
Plum., gals.....	18,800	16,800		
Nails, kegs.....	113	612		
Mf. iron, pkgs.....	5	177		

British Guiana.	Quan.	Val.	Quan.	Val.
Plum., gals.....	25,000	3,038		

British East Indies.	Quan.	Val.	Quan.	Val.
Plum., gals.....	511,020	55,187		

British Possessions in Africa.	Quan.	Val.	Quan.	Val.
Hdw., cs.....	164	2,159		
Mf. iron, pkgs.....	1	290		
Ag. imp, pkgs.....	163	2,137		
Plum., gals.....	37,600	4,473		

British Australia.	Quan.	Val.	Quan.	Val.
Hdw., cs.....	2	151		

Havre.	Quan.	Val.	Quan.	Val.
Ag. imp, pkgs.....	20	615		
Sew. ma., cs.....	201	2,500		

Palma.	Quan.	Val.	Quan.	Val.
Plum., gals.....	143,500	13,650		
Hdw., cs.....	1	10		

Cuba.	Quan.	Val.	Quan.	Val.
Mf. iron, pkgs.....	812	5,813		
Mach'y, pkgs.....	14	562		
Cartridges, cs.....	3	88		
Arms, cs.....	7	70		
Bullets, cs.....	2	125		
Hdw., cs.....	2	145		

## IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending Jan. 4, 1882:

Hardware.	Quan.	Val.	Quan.	Val.
American Salt Co.	1	200		
Mach's, case.....	1	200		
Baker Hermann & Co.	1	200		
Cutlery, cases.....	19	2,176		
Cutlery, case.....	1	53		
Guns, cs.....	18	1,124		
Files, cases.....	2	221,522		
Hammers, cs.....	2	21,210		
Cart, shells, cs.....	26	517		
Cases.....	4	182,876		
Cunningham J. L. T. & Co.	1	38,927		
Iron mills, cases.....	35	4,684		
Davies & Co.	1	3,568		
Bale.....	1			
DeMater C. H. & Co.	1			
Packages.....	5			
Dodge.....	12			
Duval H. R.	1			
Cases.....	3			
Erdmannsdorf M.	1			
Rifles, cs.....	1			
Folsom H. & D.	1			
Guns, cs.....	10			
Field Alfred & Co.	1			
Chain, cases.....	17			
Cases.....	11			
Anvils.....	150			
Graef Cutlery Co.	1			
Cases.....	11			
Ginnet H. E.	1			
Hildick A. H.	1			
Anvils.....	100			
Vises.....	20			
Vises, case.....	1			
Hart A. H. & Co.	1			
Mach'y, cs.....	1			
Hennel & Esser	1			
Cases.....	1			
Hensel, Bruckman & Lohbacher	1			
Mach'y, cs.....	2			
Knitting Machine Co.	1			
Cases.....	1			
Knauth, Hachod & Kuhne	1			
Mach'y, cs.....	2			
Meyer H. A. Jr.	1			
Packages.....	27			
Moseman C. M. & Bros.	1			
Cases.....	2			
Pim, Forwood & Co.	1			
Machines, cs.....	2			
Plunkett J. E.	1			
Machines, pkgs.....	16			
Rothschild L. & Co.	1			
Schoverling	1			
Gales.....	12			
Cases.....	12			
Stetson, Nahum.	1			
Mach'y, cs.....	1			
Tillotson L. G. & Co.	1			
Cases.....	1			
Vom Cleff & Co.	1			
Cases.....	5			
Ward A.	1			
Cases.....	1			
Wiebusch, Hilger & Co.	1			
Chain, cs.....	49			
Cutlery, cs.....	44			
Misc., pkgs.....	9			
Cases.....	3			
Winchester Arms Co.	1			
Cases.....	1			
Witte John G. & Bro.	1			
Cutlery, cs.....	44			
Sheep Shears, cs.....	6			

Iron.	Quan.	Val.	Quan.	Val.
Anderson, Wright & Co.	1			
Old rails, pcs.....	10,44			
Barnes Bros. & Co.	1			
Wire rods, coils.....	1280			
Old rails, pcs.....	2818			
Becker F.	1			
Castings, cs.....	3			
Brown Bros. & Co.	1			
Wire rods, coils.....	3512			
Rivet rods, coils.....	251			
Wire rods, coils.....	1089			
Codding T. B. & Co.	1			
Sheet iron, bds.....	251			
Sheet iron, bds.....	197			
Duval H. R.	1			
Forg. for axles.....	367			
Field C. D. & P.	1			
Pig, tons.....	108			
Gamon Thomas.	1			
Tubes, case.....	1			
Great Western Ds. Co.	1			
Tubes, bds.....	123			
Pig, tons.....	100			
Henderson Bros.	1			
Pig, tons.....	100			
Hill, Edward	1			
Oxide iron, cs.....	10			
Lang W. Bailey	1			
Bars.....	212			
Bundles.....	20			
Lundberg Gus.	1			
Coils.....	1224			
Nails, coils.....	18			
Bars.....	1036			
Millikin & Smith.	1			
Wire, bds.....	123			
Wire rods, bds.....	5046			
McDonald J. R.	1			

Cask, 1	
Wichouse, Hilger & Co.	
Culm, cks., 47	
Culley & Co., bgs., 44	
Coals, pkgs., 9	
C sks, 3	
Winchester Arms Co.	
Culley, 1	
Witte, J. G. & Bro.	
Cases, cs., 44	
Sheep shears, cs., 6	
<b>Iron.</b>	
Anderson, Wright & Co.	
Old rails, csk, 1204	
Baring Bros. & Co.	
Wire rods, cks, 1250	
Old rails, cps., 2818	
Becker F.	
Castings, csk, 3	
Brown Bros. & Co.	
Wire rods, coils, 3512	
Rivet rods, coils 259	
W. H. E. L., 1089	
Coddington T. B. & Co.	
Sheet iron, bxs, 257	
Sheet iron, bbs, 197	
Puval H. R.	
Forg. for axles, 367	
De C. de P.	
Pig, tons, 100	
Gamon Thomas,	
Great Western Du. Co.	
Tubes, bbl, 123	
Pig, tons, 100	
Henderson Bros.	
Pig, T. 100	
Hill, Edward	
Old iron, cks., 10	
Lang W. Bailey,	
Bars, 12	
Bundles 20	
Lundberg Gus.	
Coils, 1254	
Wire, coils, 18	
Bgs., 1016	
Millikin & Smith,	
Wire, bbls, 1703	
Wire rods, bbls., 5246	
McDonald J. R.	
<b>Metals.</b>	
Ansonia Clock Co.	
Cases, 2	
Baring Bros. & Co.	
Tin, slabs, 375	
Tin plates, bxs., 2440	
Bond, Parson & Co.	
Tin plates, bxs., 3000	
Bruce & Cook,	
Tin plbs., bxs., 1250	
Dickerson, Van Dusen	
Tin plts, bxs., 3793	
Elwell J. W. & Co.	
Copper, cask, 1	
Lead, bbl., 1	
Metal, bhd., 1	
Harley & Graham,	
Zinc, pkgs, 3	
Ketchum E.	
Tin plts, bxs., 102	
Lalanc & Grosjean,	
Case, 1	
Lazarus A. S. & Co.	
Old metal, csk, 4	
May's Sons, Josiah	
Zinc oxide, bbls., 150	
McGee James,	
Tin plates, bxs., 700	
Meyer, A. & E.	
Zinc oxide, 5	
Zinc oxide, bbls., 35	
Phelps, Dodge & Co.	
Tin plst, bxs., 17,586	
Black taggers, 240	
Pratt, Charles & Co.	
Tin plates, bxs., 1465	
Rump C. F.	
Brass frame, &c., 1	
Val & Dreyfus,	
Copper, bbls, 26	
<b>Order.</b>	
Tin plts, bxs., 11,778	
Vt. metal, cks., 52	
Ingots, 153	
Targers, bxs., 157	
Tin, ingots, 5	
Spelter, plates, 10,666	
Spelter, ingots, 3747	



the entire year, either on Steel Blooms or in re-rolling iron. Prices have been uniformly steady, \$47 being the quotation during almost the entire year—varying probably \$1 per ton on large orders, according to the price of material, \$46 being the lowest quotation and \$48.50 the highest for standard Rails—the great bulk of business having been done at an average of about \$47 at mill. The outlook in the Iron Rail trade is not encouraging; many of the mills having virtually abandoned the business, and are now employed on Merchant Iron, Steel Blooms, or such small orders as may be offered from time to time for Iron Rails. The general opinion is that competition with Steel Rails is impossible, and that the day for Iron Rails has passed.

**Old Rails.**—This branch of the Iron trade has been a disappointing one during the entire year. Prices opened in January at \$27 for Flanges, and steadily advanced until \$28.50 was realized in February. Early in March a slight reaction set in, and a decline of about 50¢ per ton took place before the close of the month, which was followed by \$1 decline during April, and still another \$1 during May. Prices in June opened at about \$26, and at times the market gave indications of improvement, but finally settled back to \$25.50 @ \$26. During July prices steadily improved, selling up to \$27 before the close of the month, improved still further during August, and before the close of September sold at \$28. A further advance was made in October and November, sales having been made as high as \$30. During December the market reacted and prices became very irregular. D. H.'s were sold as low as \$30, and T.'s at something below \$29. The demand is extremely small, and although stocks in sight are only trifling, it is impossible to effect sales without making concessions. One reason is, that offerings of American Rails at interior points are larger than for some time past, and another, because of the falling off in the demand for re-rolling purposes. The year opens with prices nominally \$29.50 for T.'s and \$30.50 for D. H.'s, but with very little disposition to buy.

#### PITTSBURGH.

[By Telegraph.]

Pittsburgh, Pa., January 4, 1882.

A meeting of the Western Iron Association was held in this city to-day. The attendance was large, fifty mills being represented. The situation was fully discussed, and the motion to affirm the 2½-cent card was carried almost unanimously. The meeting adjourned for three weeks.

Office of The Iron Age, 77 Fourth Avenue,  
Pittsburgh, Pa., Jan. 3, 1882.

The advent of the new year finds all our great manufacturing interests in good condition, much more so than at the opening of 1881, and the prospect is that 1882 will, so far as trade is concerned, exceed that of any former year in the history of the country. So far as relates to our great interest, that of Iron, the actual volume of business from July to January has been unprecedented; every mill has been worked up to its utmost capacity; yet, but few, if any, of the mills were able to close the year with their order books cleared.

The meeting of the Western Iron Association, which takes place here to-morrow, will, it is expected, be largely attended, and its action in regard to the card is looked for with a good deal of anxiety. It is reported now that the Cincinnati delegates will vote solid against any change. On Wednesday week, the regular monthly meeting of the Western Iron Association takes place, and it looks as if prices would be put up at least 25 cents per keg.

**Pig Iron.**—We have to report a continued strong market, and prices have gone up another 50 cents per ton, but the demand is not as active, apparently, as it was a week ago. While the mills, almost without exception, have a good deal of Pig bought to arrive, many of them, owing to the difficulty in getting it forward for want of cars, have been obliged to go on the market and buy or else stop their mills, and it was this as much if not more than anything else that started this recent spurt. As a rule, it is only those whose necessities are urgent that are buying at the advance, and the indications are that, for the present at least, the highest notch has been reached. Special reports were sent from here a week ago to various parts of the country, and a cable special appeared in the London Times of Dec. 27th, stating that the Pittsburgh market was active and excited, and that Forge Irons were selling readily at \$27 @ \$27.50. That the market was more active at the time in question is admitted, but there was no particular excitement, and the prices quoted are from \$1.50 to \$2.00 per ton higher than the sales warrant. It looks very much as if these reports were sent out for a purpose, and if so the author or authors should be exposed; if not they must have been gotten up by some one who was not well informed, as are many of the articles that appear in the daily papers in regard to the Iron business. Forge Iron may be quoted at \$25 @ \$25.50, 4 mos., for Neutral, and \$26, 4 mos., for do. Cinder Mixture Red-short. Bessemer, \$28 @ \$29, according to brand, with some furnacemen holding for \$30 and refusing to accept less. Foundry grades \$26, 4 mos., for No. 2, and \$28 for No. 1. The above quotations show an advance of \$2 @ \$3 per ton within the past sixty days, and while a still further rise is possible, the feeling obtains just now that the market will settle down, as the consumers are pretty well supplied, and many of them are now in a position to hold off for a time, and besides this, the furnacemen are doubtful about the wisdom of attempting to put prices any higher, for the present at least.

**Muck Bar.**—Continues very scarce, and in sympathy with the raw article prices are firm and tending upward. At present prices, it is claimed by those who are in a position to know, Muck Bar cannot be worked into ordinary Merchant Iron and afford the mill owner anything. We can report a sale of 500 tons at \$40, cash, at mill, and while it is doubtful whether much could be sold at that figure, makers insist that, in view of the enhanced cost of Pig Iron, it should bring more money.

**Manufactured Iron.**—There is plenty of business offering, as there has been for several months past, but as stated in last two or three reports, manufacturers have been refusing to book any new orders for some time past, except with the understanding that delivery is to be made at their option and the price to be market rates at time of delivery.

**Nails.**—While there has been no change made in the card, it is doubtful whether an order for a round lot would be placed at present prices. The Nail interest never was in better condition, so far as manufacturers are concerned; stocks are light, not only here, but at Wheeling and elsewhere, while the demand this year promises to exceed that of the one so recently closed.

**Wrought Iron Pipe.**—The demand has fallen off somewhat within the past few weeks, but the mills are all very busy on old contracts. Card and discounts remain unchanged; 55 to 57½ % on Gas and Steam Pipe, and 37½ % on Boiler Tubes. Oil Well Casing, 85¢ per foot, net; ditto Tubing, 25¢.

**Rails, &c.**—There have been no sales of Steel Rails reported here recently, in the absence of which we omit quotations. Railway fastenings firm, with a good deal of inquiry, and it looks as if higher prices in the near future were likely to prevail, in sympathy with the enhanced cost of Iron; Spikes are still quoted at 3¢, 30 days, but no large lots would be contracted for at this price; Splice Bars, \$2.60 @ \$2.80; Track Bolts, 4¢ @ 4½¢.

**Blooms and Billets.**—Bessemer Rail Blooms are quoted at \$46 @ \$48, and Billets at \$63 @ \$65, with but few offers to sell and a good deal of inquiry.

**Steel.**—We continue to quote best brands of Refined Cast Steel at 11¢; Crucible Machinery, 6½¢; Bessemer and Open-hearth ditto, 5¢; Bessemer Spring, 4½¢; Open-hearth ditto, 4½¢; Steel Boiler Plate, 6½¢ @ 7¢.

**Scrap.**—There is a fair business, and prices are firmer, in sympathy with Pig Iron, but without quotable change. Wrought Scrap, \$30 @ \$32 per net ton; sales of Crop Ends at \$30 @ 31 gross ton, and Old Car-wheels at \$31 @ \$32; Car Springs and Axles, \$38 @ \$40 per net ton; Wrought Turnings, \$20 @ \$21; Cast Boring, \$16 @ \$17, gross.

**Window Glass.**—There are but few new orders. Some of our manufacturers are still working on old contracts. No change in card or discounts.

**Coke.**—Scarcity of cars is the great source of complaint on the part of Coke makers, for want of which many of them are unable to meet their engagements, and consumers are almost as much annoyed as producers. Prices firm, \$1.70 @ \$1.80, free on cars at ovens; 15¢ @ 25¢ per ton additional for small foundry orders.

#### CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, Chicago, Dec. 31, 1881.

**Pig Iron.**—No change has as yet occurred in this market, the general belief among dealers being that the price of Pig Iron will be advanced within the next 60 days from \$1 to \$2 per ton over the present quotations, and that the same will be sustained. Inquiries are numerous. We quote: Lake Superior Charcoal, Nos. 1 and 2, \$31; No. 3, \$32; Nos. 4, 5 and 6, \$33 @ \$34. Calumet, \$28 @ \$29. Silvery Soft, \$26 @ \$27. Crane, No. 1, \$29; No. 2, \$28.50. Thomas, \$28.50 @ \$30. Imported Scotch, \$30 @ \$31, and American Scotch, \$27 @ \$30.

**Manufactured Iron.**—The demand for Merchant Iron continues active, with no change in prices. We quote: Bar, 3¢; Angle, 4¢; T, 4½¢; Beams and Channels, 4½¢ @ 4¾¢; Hoop at 3.80¢ rates. Sheet, Plate and Tank, which latter is very scarce, as follows: 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 and 26 ditto, 5¢, and 27 ditto, 5.20¢. Patent Cold-rolled Shifting, 20 ¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 5½¢ rates; Ulster Iron, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7½¢ off list; Wrought Boat Spikes, 4¢ rates.

**Nails.**—Demand is good, stocks fair and market firm at \$3.40 for rod, to 60d. in car-load lots, and \$3.50 for smaller orders.

**Steel.**—Tool, Machinery and Agricultural Steels are fairly active, and the following quotations are strictly adhered to: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢, and soft Steel Center Plow, 10½¢.

**Scrap Iron.**—Quotations remain unchanged, while the inquiry is rather dull, due to the fact that mills are closing up the year's business. The indications point to a revival of trade in the near future. We quote dealers' purchasing prices as follows: No. 1 Wrought Scrap, \$24 @ \$25, net ton; No. 1 Railroad Scrap, \$27 @ \$28; ditto Heavy Cast, \$20; ditto Stove Plate, \$14; ditto Cast Iron Boring, \$7 @ \$8, and ditto Machine Shop Turnings, \$11 @ \$12.

#### CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., Chattanooga, Jan. 2, 1882.

Business has been excellent during the week in spite of the holiday festivities. Prices remain very firm at our last figures. A season of more than usual activity will certainly succeed the holidays, and prices are expected to then slightly advance. The weather during the week has been rainy, closing sharp, with threatening snow.

**Pig Iron.**—The Pig Iron market is very strong. Furnacemen are extremely cautious in contracting further for future delivery, expecting they may do still better than the present favorable prices a month hence. We have no changes to report, but the chances favor another advance in the Northern markets, and this market always follows those in

a rather slow and conservative way. We quote: No. 1 Foundry, \$25 @ \$27; No. 2 Foundry, \$22 @ \$24; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Car-wheel Metal, \$38 @ \$40.

**Ores.**—Movements now on foot look to the proper opening of very large beds of Iron Ore at various points near transportation lines, and combination may soon succeed to competition, as is now the case with the Northern Ore supplies. Prices here remain steady. We quote: 50 % Brown Hematite, per ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

**Miscellaneous Articles.**—We quote Old Rails, \$29, and strengthening in sympathy with the advance in Mill Irons. Wrought Scrap, \$24 @ \$27; Cast Scrap, \$14 @ \$17; Old Wheels, \$28 @ \$30.

**Nails.**—Are steady at \$3.25 rates, and mills are pressed to fill orders.

**Manufactured Iron.**—There is not much prospect here apparent that the contemplated advance in Bar by the Pittsburgh makers and dealers will be followed; our millmen seem to think they have a good enough business as it has been going for the last two or three months. They are at least disposed to be conservative, having found booms the reverse of profitable. We quote Bar strong at \$2.75 rates; Railroad Spikes, \$3.30; Track Bolts, \$4.25; Fish Plate, \$3.

**Coal.**—Fancy Lump, \$5 net ton; Common, \$4.25; run of mine, \$2 at mills.

**Coke.**—Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

**Steel and Iron Rails.**—Steel Bars, \$62 @ \$64 at mill; Iron, \$50 @ \$52; Small, \$57 @ \$60.

#### BOSTON.

DECEMBER 31.—The tone of the Boston market is reported very strong and there is a very good trade for this season of this year. During this week, the last of the year, there is, of course, a holding off from buying, but it is stated that after the first of January the demand is expected to be very good and that prices will go somewhat higher. It is a fact that the available stocks are small and that the furnaces express their distrust of the future condition of affairs by refusing to accept long contracts. And again, the foreign market is reported firm and rising, and in view of these facts it would not be surprising if a mild boom were to set in. We advance our quotations slightly. Prices at shipping ports for American pig are \$25.50 @ \$27 for No. 1 X; \$24 @ \$25 for No. 2 X, and \$22.50 @ \$23 for Gray Forge. Small spot lots command \$2 @ \$3 per ton above these quotations. The feeling in Foreign Iron here is very firm, but the market is quiet. The English and Scotch markets are reported firm. The stocks here are light, and there is a tendency toward higher prices. We quote: Eglinton at \$24 for moderate-sized lots; Langdon, \$27; Gartsherrie, \$26; Cambro, \$24.75 @ \$25; Glengarnock, \$25; Clarence No. 3, \$22 @ 22.50; Shotts, \$27. Old Rails.—There is but little doing in old rails. We quote \$31 @ \$32 for American and \$30 for foreign. Manufactured Iron.—The closing of the year has caused trade to fall off somewhat, but it still may be said to be active for the season. Plate Iron is noticeably so and in consequence the prices have advanced. The foreign market for manufactured iron is reported very firm, and cable advices state that after the first of January an advance of about 10% is anticipated. Bar Iron.—The Bar Iron trade is reported very good for the season and the mills have still enough orders to keep them busy for some time to come, in some cases, it is claimed, as long as three months. The market is firm at quotations. We quote \$2.90 @ \$3 for Bar. Horseshoes remain very scarce and very much wanted at \$4.33 per keg. Swedish and Norway are very firm at \$4 for Bars and \$4.75 @ \$5 for Shapes. Plate Iron.—An advance in Plate Iron has been made in consequence of the active demand and the inability of the mills to deliver as fast as wanted, they being crowded with orders for some time to come. We quote Tank at 3¼¢; Refined at 4¼¢; Shell at 4.25¢; Flange at 5.70¢, and Tubes very firm at 37½¢ from list. Sheet Iron.—There is a good demand, and quotations remain unchanged. We quote Sheet Iron, 4½¢ @ 4¾¢; ditto Refined, 5½¢ @ 5¾¢; Galvanized, 8½¢ @ 11¼¢; Russia, 11¢ @ 12¢. Steel.—The demand for Steel continues steady and prices are firm and without change. We quote: Best English cast, 14¢ @ 15¢; American ditto, 12¢ @ 12½¢; Bessemer Machinery, 5¢ @ 6¢; Wedge and German, 7¢; English Spring and Calking, 7½¢ @ 7¾¢; ditto American, 5½¢ @ 6¢; Tire, 4¢ @ 4½¢; Sleigh Shoes, 3½¢ @ 3¾¢. Nails.—The demand is rather quiet at present, but prices are firm. We quote \$3.40 @ \$3.50 for tens per cask. Copper.—There is a quiet market for Lake Ingot, and prices are about the same, with 20½¢ asked, and sales can possibly be made at 20½¢. The prices of manufactured Copper remain unchanged at the recent advance. We quote: Sheathing, 28¢; Braziers, 30¢ @ 32¢; American Yellow Sheathing Metal, 20¢; Yellow Metal Bolt, 12¢; English Yellow Sheathing Metal, 16¢ in bond. Lead.—Lead is quiet and quoted at \$5.15 @ \$5.20 for carload lots, and in a jobbing way at \$5.30 @ \$5.50. Manufacturers' prices are unchanged. We quote: Bar, 6½¢; Pipe, 7½¢; sheet, 8¢; Tin-lined Pipe, 15¢; Tin Pipe, 35¢. All less 10 %.

**Scrap.**—There is a fair business, and prices are firmer, in sympathy with Pig Iron, but without quotable change. Wrought Scrap, \$30 @ \$32 per net ton; sales of Crop Ends at \$30 @ 31 gross ton, and Old Car-wheels at \$31 @ \$32; Car Springs and Axles, \$38 @ \$40 per net ton; Wrought Turnings, \$20 @ \$21; Cast Boring, \$16 @ \$17, gross.

**Window Glass.**—There are but few new orders. Some of our manufacturers are still working on old contracts. No change in card or discounts.

**Coke.**—Scarcity of cars is the great source of complaint on the part of Coke makers, for want of which many of them are unable to meet their engagements, and consumers are almost as much annoyed as producers. Prices firm, \$1.70 @ \$1.80, free on cars at ovens; 15¢ @ 25¢ per ton additional for small foundry orders.

**Steel.**—Tool, Machinery and Agricultural Steels are fairly active, and the following quotations are strictly adhered to: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢, and soft Steel Center Plow, 10½¢.

**Scrap Iron.**—Quotations remain unchanged, while the inquiry is rather dull, due to the fact that mills are closing up the year's business. The indications point to a revival of trade in the near future. We quote dealers' purchasing prices as follows: No. 1 Wrought Scrap, \$24 @ \$25, net ton; No. 1 Railroad Scrap, \$27 @ \$28; ditto Heavy Cast, \$20; ditto Stove Plate, \$14; ditto Cast Iron Boring, \$7 @ \$8, and ditto Machine Shop Turnings, \$11 @ \$12.

**Manufactured Iron.**—The demand for Merchant Iron continues active, with no change in prices. We quote: Bar, 3¢; Angle, 4¢; T, 4½¢; Beams and Channels, 4½¢ @ 4¾¢; Hoop at 3.80¢ rates. Sheet, Plate and Tank, which latter is very scarce, as follows: 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 and 26 ditto, 5¢, and 27 ditto, 5.20¢. Patent Cold-rolled Shifting, 20 ¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 5½¢ rates; Ulster Iron, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7½¢ off list; Wrought Boat Spikes, 4¢ rates.

**Nails.**—Demand is good, stocks fair and market firm at \$3.40 for rod, to 60d. in car-load lots, and \$3.50 for smaller orders.

**Steel.**—Tool, Machinery and Agricultural Steels are fairly active, and the following quotations are strictly adhered to: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢, and soft Steel Center Plow, 10½¢.

Wrought, No. 1..... \$1.35 @ \$1.40  
light..... 55 ¢  
Horseshoes..... 1.50  
Hoops..... 1.00  
Cotton-tie Buckles..... 2.50  
Car Wheels per ton..... 30.00  
Car Axles..... 13 1/2 ¢  
Spring Steel..... 1 1/2 @ 1 3/4  
Scrap Steel..... 1.20  
Stove Plate..... 75 ¢  
Machinery..... 90 ¢  
Turnings, Wrought..... 60 ¢  
Turnings, Cast..... 45 ¢  
Malleable Iron..... 45 ¢  
Burnt Iron..... 30 ¢  
—Journal of Commerce.

#### LOUISVILLE.

W. D. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of Dec. 31, 1881: The market for Bars is firm, and for two days past has shown unmistakable signs of excitement. Withdrawal of quotations on all sides, and the refusal to book orders except at prices ruling at time of delivery, indicate extreme caution on the part of manufacturers; the eagerness to cover for January and February wants on the part of buyers shows a confidence that takes all the risks. Mills are so full that they are very independent about the future. The more conservative ones dread a move that seems to be imminent to rush the card up to \$2.75 or \$3 even, for they will then be paying on a basis out of proportion to what they are getting for their product. Bars are jobbing from store in fair lots at \$2.75, though to wholesale buyers concessions are made. Sheet is moving in a quiet way, holding its own very well. There is no great inquiry for it. Nails are scarce at full card, nearly all the mills refusing orders at present prices. Immediate demand is lighter on account of cold weather. General business is good, with every prospect for its being better.

MESSRS. GEO. H. HULL & Co., commission merchants, report to us as follows, under date of Dec. 30, 1881: The tendency of the market is still upward. The demand is very light, as is always the case at this season of the year, but notwithstanding this a further advance of \$1 per ton has been established on Mill Irons by actual sales.

#### FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal..... \$20.00 @ 20.00  
No. 2..... 27.00 @ 28.00  
No. 1 Southern, Charcoal..... 26.00 @ 27.00  
No. 2..... 24.00 @ 25.00  
No. 1 Hanging Rock, Stonecoal and Coke..... 27.00 @ 27.50  
No. 2..... 25.00 @ 26.00  
No. 1 Southern, Stonecoal and Coke..... 26.50 @ 27.00  
No. 2..... 25.00 @ 26.00  
"American Scotch"..... 24.00 @ 25.00  
Silver Gray..... 23.00 @ 24.00  
Scotch..... 22.00 @ 23.00

#### MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral..... 24.00 @ 25.00  
No. 2 Stonecoal and Coke, Cold-short and Neutral..... 24.50 @ 25.00  
No. 1 Stonecoal and Coke, Cold-short and Neutral..... 23.00 @ 24.00  
No. 2 Missouri and Indiana Red-short and Neutral..... 20.00 @ 22.00

#### CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast..... 35.00 @ 38.00  
Alabama..... 34.00 @ 35.00  
Kentucky Cold-blast..... 34.00 @ 35.00  
Hanging Rock, W. B..... 30.00 @ 33.00

#### CINCINNATI.

January 2, 1882.—Pig Iron.—During the week there has been less inquiry for Foundry grades. Charcoal Car-wheel kinds are being sought for delivery through the coming year and are readily found at former quotations. The inactivity in Forge kinds has changed to activity, and sales have been made at prices meeting the views of the makers. Stocks of all kinds of Pig Irons are very light as compared with this time last year, with a firm market at an advance of about \$4 per ton on Charcoal, Coke and Stonecoal Foundry and Mill Irons. This advance in prices, it is thought, will surely cover the additional cost of production last year. This increased cost has originated mainly from the higher wages of labor in all the departments incident to the production of Pig Iron throughout the West and South. Present prices can be sustained, and the Western and Southern Irons enjoy their usual and natural markets as against the Eastern American and foreign makes. Both producers and consumers watch closely the reports of the Eastern American and foreign markets, and are not slow to avail themselves of the information. The present low rates of freight by rail from the seaports is a large factor in determining as to what prices can be made and sustained on Western and Southern Pig and Bar Iron. The following quotations of prices are very firm; no considerable quantity can be had on time: Hanging Rock Charcoal Foundry, No. 1, \$29.50; Good, \$29; No. 2, \$29; No. 1 Coke, \$28; No. 2, \$27; Virginia, \$27 @ \$26; Alabama, \$26 @ 25; Hanging Rock American Scotch, No. 1, \$27.50; No. 2, \$26.50; Silver Grey Softeners, No. 1, \$26.50; No. 2, \$25.50; No. 3, \$24.50; Forge Irons, \$24.50 @ \$28; Cold-blast Charcoal Car-wheel Irons, \$35 @ \$38; Warm-blast, \$30 @ 37; Bar Irons, \$2.70, card rate. Scrap: Wrought, \$1.10 @ \$1.40; Cast, 60¢ @ 90¢ per 100 lbs.; Old Car Wheels, \$28 @ \$30; Rails, \$28 @ \$30 per ton of 2240 lbs.

#### BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Dec. 31, 1881: With the close of the year we find trade in a most remarkably healthy condition, with every indication of higher values ruling in the near future. Stocks are low and greatly reduced, with demand in excess of prompt delivery, thus causing the outlook to be all that could reasonably be expected.

Ref. Bar Iron, 1 to 6 x 3/4 to 2..... \$ 2 1/2 @ 3 1/2  
" " 1 to 4 1/2 x 1 1/2 to 2..... " 2 1/2 @ 3 1/2  
" " 1/2 to 2, Round..... " 2 1/2 @ 3 1/2  
and Square..... " 2 1/2 @ 3 1/2  
Hoop Iron, 1 1/2 wide and upward..... 3 1/2 @ 3 1/2  
Band Iron from 1 1/2 to 4 in. wide..... 3 1/2 @ 3 1/2  
Horse-shoe Iron..... 3 1/2 @ 4 1/2  
Norway Rail Rods..... 5 1/2 @ 6 1/2  
Black Diamond Cast Steel..... 13 1/2 @ 14 1/2  
Machinery Steel..... 9 @ 9 1/2  
Cast Spring Steel..... 8 @ 8 1/2  
Common Horse Nails..... 10 @ 14 1/2  
Perkins' Horse shoes per keg of 100 lbs..... \$4.37 1/2  
" Mule shoes..... 5.37 1/2

#### ST. LOUIS.

MESSRS. HOFFER, PLUM & Co. Pig Iron and Iron Ore merchants, 417 Pine street, write us, under date of Dec. 31, 1881: The

late advance in Mill Iron in the Eastern and larger markets, and the decidedly "bullish" reports from those points, do not seem to materially change the views of makers or consumers, as reflected in last week's report. The week has been bare of notable transactions, and generally devoid of interest. The quotations of last week fairly represent this market, with the exception that Neutral or Cold-short Mill Irons may be quoted from \$1 to \$1.50 higher.

#### NOT BLAST CHARCOAL.

Missouri..... \$28.00 @ 28.00  
Ohio..... 30.00 @ 31.00  
Southern..... 28.00 @ 28.00

#### COAL AND COKE.

Missouri..... None offering  
Ohio..... 27.50 @ 29.00  
Southern..... 27.00 @ 27.00

#### MILL IRONS.

Red-short..... 25.00 @ 26.00  
Neutral..... 23.00 @ 24.00

#### CAR WHEEL AND MALLEABLE IRONS.

Missouri..... 28.00 @ 34.00  
Southern..... 35.00 @ 38.00  
Ohio..... 29.00 @ 43.00

## Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Dec. 19, 1881.

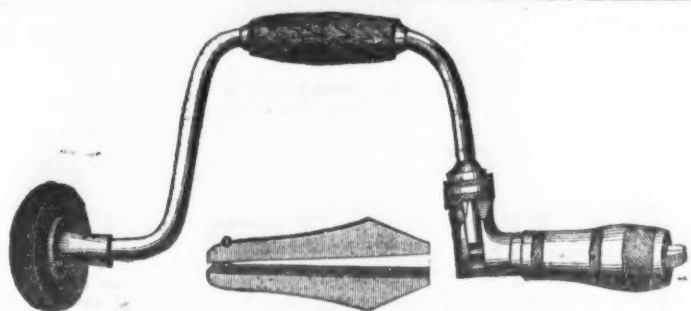
#### THE WEEK.

has not been characterized by many symptoms of change, and has in most respects been free from excitement. As will be perceived by other sections of this communication, there have been fluctuations in one or two descriptions of crude iron, but these variations, somewhat curiously, have been in opposite directions. Scotch warrants, for example, have become a shilling or so weaker, under the influence of realizations by those who had bought for the rise. Makers' brands of Scotch pig, on the contrary, have grown about a shilling dearer. West Coast hematites are 1/6 @ 2/6 per ton higher, and Northamptonshire, Derbyshire and other ordinary sorts of crude irons have become 2/6 @ 5/ per ton stiffer. Even in South Staffordshire this appreciation of values is apparent. It is, therefore, fully demonstrated that the course of Scotch warrants at the moment is in no sense a true index of the state of the British iron market. The fact is not by any means an exceptional one, yet it is probably of greater significance just now than on many former occasions. Looked at critically the view seems to be this wise: In England generally stocks are light and prices are rising; in Cleveland stocks are large and prices are sustained, but not expanding; in Scotland stocks are enormous and open quotations are weaker. I suppose a reasonable deduction from these facts is that where the reserve stocks are abnormally large the market must be kept in a weak and uncertain condition thereby. Another inference may be drawn, I am aware, but this one seems to commend itself to most of us. Speaking of stocks reminds me that the annual statistics of production, disposal and stocks left unsold will probably be issued by the Scotch Ironmasters' Association on December 27th or 28th. The figures thus promulgated will have some bearing upon the course of prices in the near future, albeit they will not materially affect the actual volume of business. In some quarters the statistics are awaited with much impatience, one might almost say anxiety, and there is the customary amount of speculation in warrants on the strength of the returns being found more favorable than it is now anticipated they will be. The only point about which there is anything like secrecy is as to makers' own holdings. We know that there are 626,000 tons in Connal's stores, but we do not know whether the report that makers have 339,000 tons in their own yards is correct. In any case it is assumed that we shall end the year with balances of pig iron something like this:

	Tons.
Scotland.....	955,000
Cleveland.....	360,000
West Coast.....	50,000
Lancashire, South and West Yorkshire.....	400,000
Derbyshire, Lincolnshire, Northamptonshire, Warwickshire, Staffordshire, Worcestershire, Shropshire, Monmouth and North and South Wales.....	1,765,000
Total.....	3,530,000

This will be a heavy aggregate of unsold materials with which to commence the year 1882, yet it may be borne in mind that large stocks are not necessarily inimical to trade progress. That idea is supported by the fact that at the end of 1870 there were 665,000 tons in Scotland, and in 1871, 490,000 tons left over, yet 1871 and 1872 count among the most prosperous years the iron trade has ever known. In a general way, however, a bulky "carrying forward" tends to repress business and depresses prices in the succeeding year, unless counteracted by an unusually large demand. At the end of the following years stocks on hand in Scotland have been as under:





## BIT BRACES FOR 1882.

After having made almost every kind of a Bit Brace and tried them on the market, we find that our BARBER IMPROVED BRACE, as seen in this Cut, is the only one which gives universal satisfaction. During the past six months we have made some slight changes on this Brace, which removes all objections to it and make it absolutely perfect. We are aware that other Braces are sold at a less price, but they are also made at a less cost. Everything which goes into the Barber Brace is of the best and most expensive quality, and one of them will outlast six of any other kind. The Sweeps and Jaws are of steel, the Head of lignumvite and Revolving Handle of rosewood. It is highly polished and heavily nickel plated. The Jaws will hold, without any fitting, Tool Shanks of every shape, including Round Twist Drills. When furnished with the Ratchet Attachment, for boring in places where the Sweep cannot be revolved, it is the only Brace which will answer that purpose. We have not changed the price for many years, and do not anticipate any change in the near future; but from year to year we have been adding to the quality so as to make the cost to us double what it was ten years ago. We have recently added to our manufacturing facilities, and are now prepared to supply the world with Braces.

### LIST PRICES.

No. 10—14-inch Sweep, per dozen...\$33.00	No. 14—6-inch Sweep, per dozen...\$21.00
No. 11—12-inch Sweep, per dozen... 30.00	No. 31—12-inch Sweep, per dozen... 39.00
No. 12—10-inch Sweep, per dozen... 27.00	No. 32—10-inch Sweep, per dozen... 36.00
No. 13—8-inch Sweep, per dozen... 24.00	No. 33—8-inch Sweep, per dozen... 33.00

MILLERS FALLS CO., 74 Chambers St., New York.

## HEATON & DENCKLA HARDWARE CO., Hardware Commission Merchants,

507 Commerce Street, Philadelphia.

E. & G. BROOKE'S "Anchor Brand" Nails, Brads, Spikes, &c.  
MALLORY, WHEELER & CO.'S Door and Pad Locks.  
UNION MANUFACTURING CO.'S Butte.  
AMERICAN SCREW CO.'S Screws.  
D. R. BARTON TOOL CO.'S Edge Tools, &c.  
FRANCIS'S Shutter Holders.  
Anti-Window Rattlers, Brass and Nickel-Plated.  
WESTERN FILE CO.'S Cast-Steel Files.  
AMERICAN SHEAR CO.'S Shears and Scissors.  
HP NAIL COMPANY'S Wire, Steel, Iron and Brass Nails and Barbed Nails.  
STEELE & SONS' Wrought Handle Sad Irons.

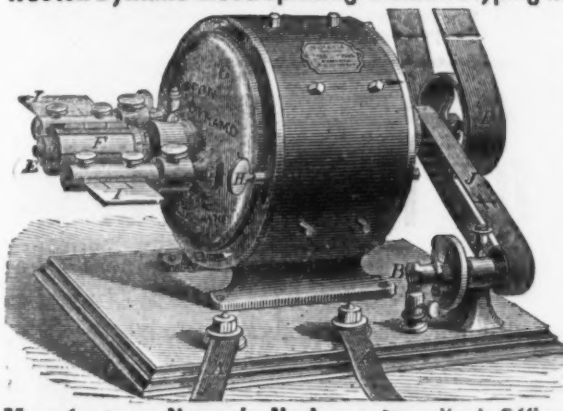
EXCELSIOR MILLS. Genuine Turkish Emery.  
BROWN & BRO.'S Silver Plated Spoons and Forks.  
GAYLORD MANUFACTURING CO.'S Tin, Chest and Cupboard Locks.

AMES' Genuine Chester Emery.

COLWELL & COLLINS, NORWAY BOLT CO., Norway Carriage and Tire Bolts.  
PLYMOUTH MILL CO.'S Black and Tinned Iron Rivets.  
AMERICAN MACHINE CO.'S Fluters, &c.  
STUART PETERSON & CO.'S Tinned and Enamelled Ware, &c.

Also a large line of Heavy and Shelf Hardware.

## HANSON & VAN WINKLE, Sole Agents for Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.

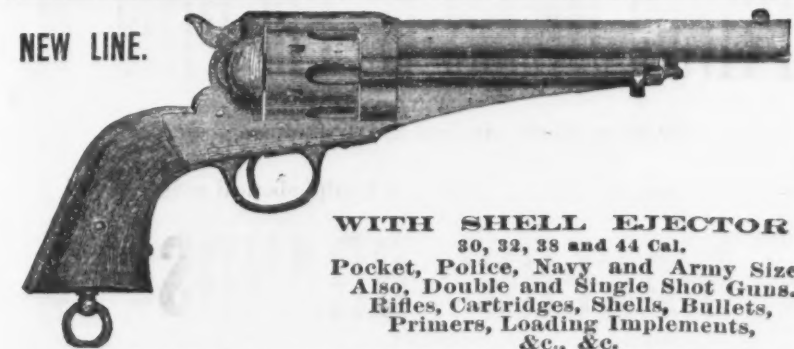


For Nickel, Bronze, Brass, Copper and Silver Plating.  
Over 1000 machines in use.  
Are used by all leading store manufacturers.

Experienced men sent to put up machines and instruct purchasers.  
**INFRINGEMENTS.**  
We call attention to infringers of the Weston Machine in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

MANUFACTURERS OF  
Cast Nickel Anodes, Pure Nickel Salts, Polishing Materials.

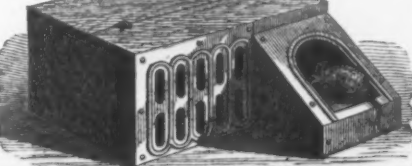
Manufactory, Newark, N. J. New York Office, 92 & 94 Liberty St.



NEW LINE.  
**WITH SHELL EJECTOR**  
30, 32, 38 and 44 Cal.  
Pocket, Police, Navy and Army Sizes  
Also, Double and Single Shot Guns.  
Rifles, Cartridges, Shells, Bullets,  
Primers, Loading Implements,  
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by  
**E. REMINGTON & SONS, NEW YORK**  
283 Broadway,

**THE DELUSION. THE GEM CARPET STRETCHER.**



Patented June 8, 1880.  
**The Best and Cheapest in Use.**  
DIRECTIONS.—Tack the carpet at one side of the room, then go to the other side, and with the stretcher draw the carpet into place, leaving the spur a few inches from the base-board. Take up the slack in the carpet under the spur and drive the spur gently into the floor; it will hold the carpet in place while you drive the tacks. Manufactured by

CLAUDIUS JONES & CO., Erie, Pa.

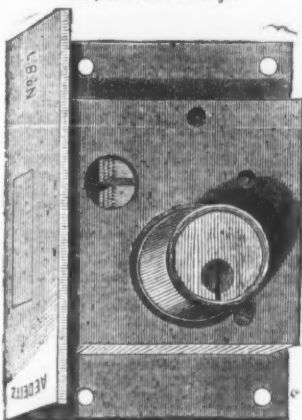
## CHARLES H. HOWELL & CO.,

MANUFACTURERS OF FIRST QUALITY

## PAINTS, COLORS, OILS, VARNISHES, DRYERS.

212, 214 & 216 Race St., Philadelphia, U. S. A.

**A. E. DIETZ,**  
(Successor to Barnes & Dietz.)  
Manufacturer of  
Store Door Locks, Night Latches, Padlocks, Drawer Locks,  
&c., with Flat Steel Keys.



**Durrie & McCarty, Agents,**

97 Chambers & 81 Reade Sts., New York.

**THE FORSYTH SCALE CO.,**  
YOUNGSTOWN, O.,

Manufacture a full line of

**FORSYTH'S STANDARD SCALES,**  
Counter, Portable, Dormant,  
Stock and Hay, and  
R. R. Track

### SCALES.

Call Special Attention to their  
**SUSPENSION HAY & R. R.**  
**TRACK SCALES.**

Also, Warehouse Trucks and Letter Presses.

PRINCIPAL WAREHOUSES,

**DURRIE & McCARTY, New York;**

**FORSYTH SCALE CO., Chicago;**

**SIMMONS HARDWARE CO., St. Louis.**

**PRIZE MEDALLISTS:**

Exhibitions of 1862, 1865, 1867, 1873, 1875, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876; Paris, 1878, and Melbourne, 1881.

**CLARK, BUNNETT & CO., LIMITED,**

Late **CLARK & COMPANY,**

Original Inventors and Sole Patentees of

Noiseless Self-Coiling Revolving

**STEEL SHUTTERS,**

FIRE AND BURGLAR PROOF. ALSO IMPROVED

**ROLLING WOOD SHUTTERS,**

Of various kinds. And Patent

**METALLIC VENETIAN BLINDS.**

Endorsed by the

Leading Architects of the World.

Send for Catalogue.

Office and Manufactory,

162 & 164 West 27th St., N. Y.



**R. D. WOOD & CO.,**

Philadelphia,

Manufacturers of

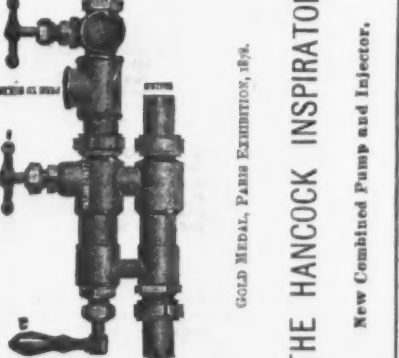
**Cast Iron Pipe**

FOR WATER AND GAS,

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.



Eclipse all other appliances hitherto introduced for feeding Steam Boilers. A Portable Boiler is not perfect without one. It lifts its water 3 feet with a low steam pressure, and puts it directly into the Boiler. No adjustment necessary for varying steam pressures.

**G. W. STORER, General Agent,**

149 N. 3d St., Philadelphia.

No. 35

$\frac{3}{8} \times 1\frac{1}{2}$

**BROWNING, SISUM & CO., 85 Chambers St.,**

Manufacture

Belt Hooks, Cotter's, Spring Keys, D Rings, Staples, and everything pertaining to wire leading.

Factory, BROOKLYN.

**L. COES'**  
Genuine and Mechanics  
**PATENT**  
**Screw Wrenches**  
MANUFACTURED BY  
**L. COES & CO.,**  
Worcester, Mass.  
ESTABLISHED IN 1839.

Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

**L. COES & CO.,**  
Worcester, Mass.  
Warehouse,  
97 Chambers and 81 Reade Sts.,  
NEW YORK.  
**DURRIE & McCARTY,**  
Sole Agents.

## The 1882 Pennsylvania Lawn Mower.

OUTSTRIPS ALL COMPETITORS. PREMIUMS TAKEN OVER ALL OTHER MOWERS.  
EVERY MACHINE WARRANTED TO WORK AS REPRESENTED.



BEST 10-INCH FORWARD CUT LAWN MOWER in the MARKET, named "QUAKER CITY."

For descriptive catalogue and prices write to  
LOYD, SUPPLEE & WALTON, Philadelphia.  
DURRIE & McCARTY, New York.  
AMES PLOW CO., Boston, Mass.  
PRATT & CO., Buffalo, N. Y.  
SIMMONS HARDWARE CO., St. Louis, Mo.  
HAMILTON & MATHEWS, Rochester, N. Y.  
MARKLEY, ALLING & CO., Chicago, Ill.

DUCHARME, FLETCHER & CO., Detroit, Mich.  
LOCKWOOD, VANDOREN & TAYLOR, Cleveland, O.  
ANDERSON HARDWARE CO., Indianapolis, Ind.  
WM. FRANKFURTH & CO., Milwaukee, Wis.  
H. W. ROUSE, Peoria, Ill.  
LOYD & CLARKE, La Crosse, Wis.  
T. M. CLARKE & CO., Atlanta, Ga.

**CHAMPLAIN**  
**Forged Horse Nails.**  
MANUFACTURED BY THE  
**NATIONAL HORSE NAIL CO.,**  
Vergennes, Vermont.  
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST  
NORWAY IRON AND WARRANTED.  
A full line of "CHAMPLAIN" and "NATIONAL"  
Nails always on hand at our Warehouse,  
97 CHAMBERS AND 81 READE STREETS, NEW YORK.  
**DURRIE & McCARTY, Sole Agents.**

## NEW ENGLAND BUTT CO.,

Manufacturers of

**Drilled Cast Butt Hinges**

IN GREAT VARIETY.

New England Gate Hinges. Sad Irons, Polishing Irons.  
Woolman's Self-Closing Gate Hinges. Mrs. Cook's, McCoy's and New England Polishing Iron.  
Barn Door Hangers, Rolls & Rail. Laundry and Tailors' Irons,  
Sliding Door Rolls and Way. Tailors' Box Irons.  
Butterworth Window Springs. Detachable Handle Sad Irons.  
Grindstone Fixtures. Waffle Irons.  
Patent Saw Clamps. Foot Scrapers.  
Patent Floor Jacks. Patent Foot Scraper and Cleaner.  
Cistern Tops and Covers. Braiding Machinery for Silk, Worsted  
Stair Rail, Store and Fancy Brackets. or Cotton, and for covering  
Harness Hooks and Brackets. Whips and Telephone Wire.  
Flush Pulls, Small Anvils, Dumb Bells. Fine Castings a specialty.  
**WORKS AT PROVIDENCE, R. I.**  
New York Office, 99 Chambers Street.  
**BOSTON AGENTS—NASHUA LOCK CO.**

**VARIETY IRON WORKS.**  
**KYSER & REX,**  
Manufacturers of  
Hardware Specialties, Iron Toys, Novelties  
and Housefurnishing Hardware,  
Main Office and Factory, Trenton Ave. and Margaretta St., Frankford, Philadelphia.  
Branch Office, 19 & 21 S. 4th St., Phila. Hardware specialties manufactured to order.



\_\_\_\_\_

# BRANDS OF TIN PLATE.

---

In view of the fact that our house has always refused to import any

## Private Brands of Tin Plate,

and have for years openly opposed the system, we soon expect to publish (about February 1st) a list, in alphabetical order, of

### MAKERS' BRANDS

OF BRIGHT AND ROOFING PLATES,

which we will furnish our customers only on application. The pernicious system of private brands can only be broken up by dealers and consumers refusing to accept any other brands than in this list.

---

## MERCHANT & CO.,

### PHILADELPHIA.

CLIFF & BEEKMAN STS., NEW YORK.

Address all orders to Philadelphia.



# TURBINE AND BUCKEYE WIND ENGINES, Buckeye Force Pumps,

AND

## BUCKEYE LAWN MOWERS.

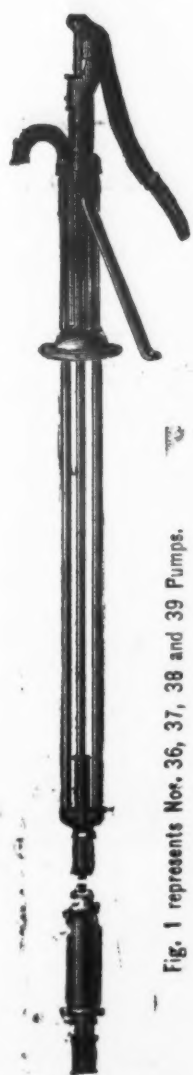
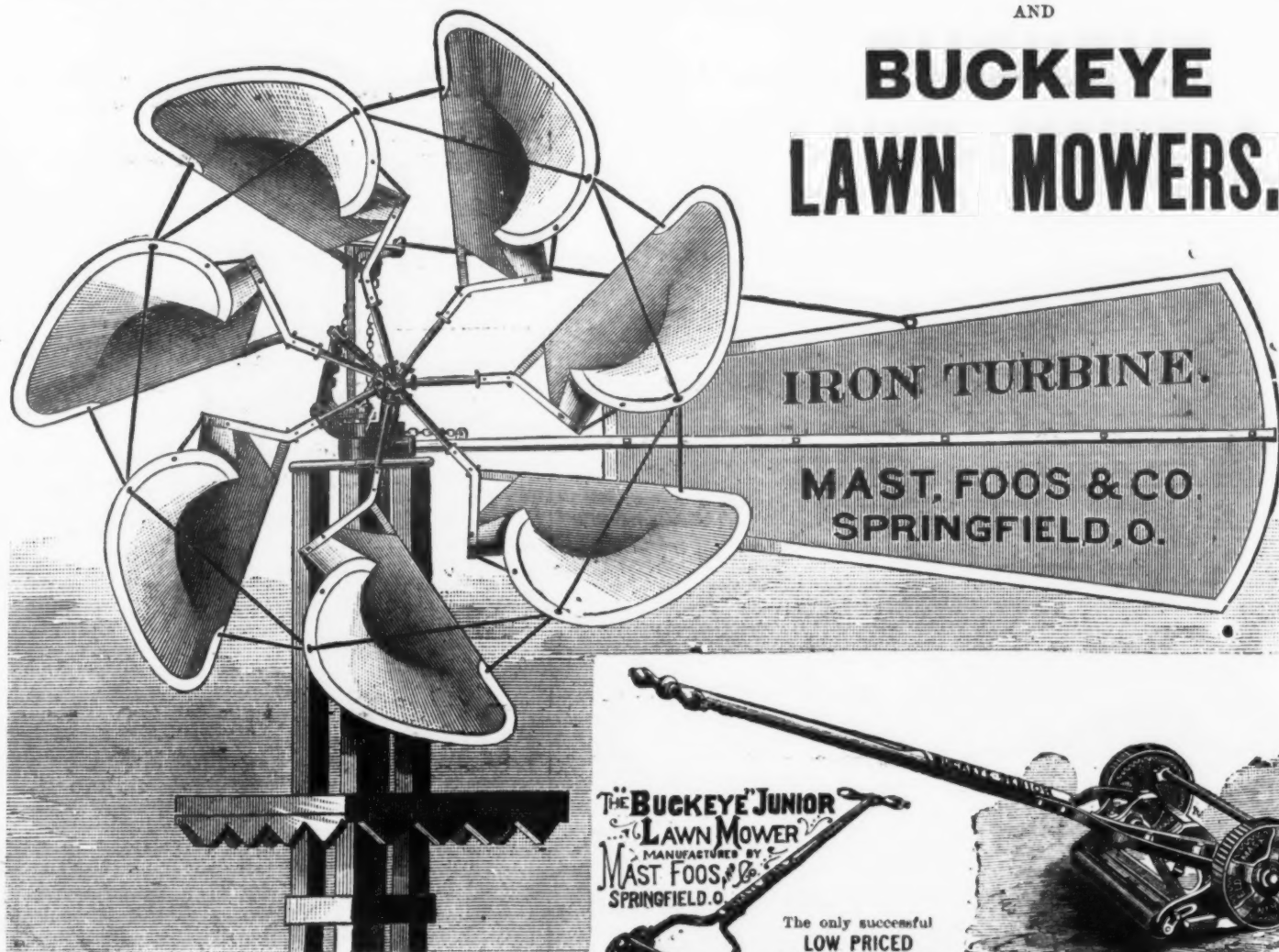


Fig. 1 represents Nos. 36, 37, 38 and 39 Pumps.



IRON TURBINE.

MAST, FOOS & CO.  
SPRINGFIELD, O.THE BUCKEYE JUNIOR  
LAWN MOWER  
MANUFACTURED BY  
MAST, FOOS & CO.  
SPRINGFIELD, O.The only successful  
LOW PRICED  
LAWN MOWER  
in the market.  
Made in three sizes—  
10, 12 and 14 in. cut.

BUCKEYE SENIOR.

FIVE SIZES—10, 12, 14, 16, 18 IN. CUT.

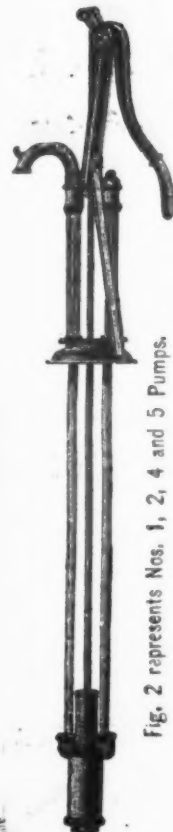


Fig. 2 represents Nos. 1, 2, 4 and 5 Pumps.

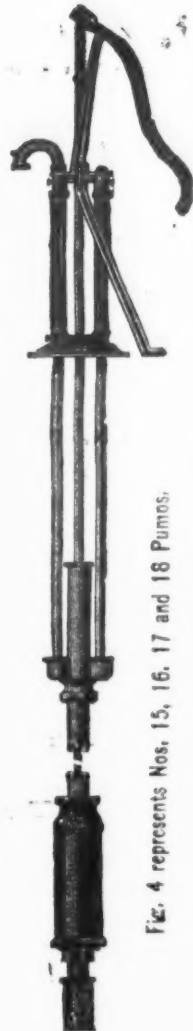
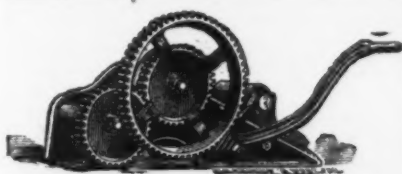


Fig. 4 represents Nos. 15, 16, 17 and 18 Pumps.

### MAST, FOOS & CO., Springfield, Ohio, U. S. A.



## Quick Adjustable Tire Bender.

The best and cheapest arrangement for bending tires in the market. Simple in construction, adjustable to any size or diameter tire.

No. 1 bends any tire up to 4 in. wide. Price, \$10.00.

No. 2 bends any tire up to 6 in. wide. Price, \$12.00.



## IMPROVED AUTOMATIC TIRE AND AXLE UPSETTER.

The most perfect machine for upsetting or shrinking wagon tires, axles, braces, &c., ever placed in the market. Every blacksmith should have one. They are cheaper than any other machine, and one man operates it alone. Liberal discount to the trade and agents. Send for circulars and discount. Correspondence with jobbers solicited.

No. 1 upsets any tire up to 3 in. wide x 4 in. Price, \$10.00.

No. 2 upsets any tire up to 4 in. wide x 4 in. Price, \$12.00.

For sale by RUSSELL & ERWIN MFG. CO., 45 Chambers St., New York, and E. C. TROMBLY & CO., Philadelphia, N. Y. (P. O. Box 310), Mfrs. and Proprietors.

### STAR LOCK WORKS.

ESTABLISHED 1836.

Trunk Locks, Door Springs,  
Pad Locks, Trunk Stays,  
Dead Latches, Keys, &c., &c.  
110 South 8th St., and Sanson, bet. 8th  
and 9th, PHILADELPHIA.



HILLEBRAND &amp; WOLF.



Established 1838.  
Bevin Bros. Mfg.  
Co.,  
Easthampton, Ot.  
Manufacturers of  
SLEIGH BELLS,  
House, Tea, Hand,  
Gong Bells, &c.  
Bell Metal Kettles.

### WILCOX & HOWE, BIRMINGHAM, CONN.,

Manufacturers of

## CARRIAGE IRON FORGINGS



The "Derby."

COMPRISING

The "Diamond."

FIFTH WHEELS, BODY LOOPS, STAY ENDS, OFFSETS, SLAT IRONS,  
REACH PLATES, JOINT ENDS, STEPS, &c.

WE GUARANTEE OUR GOODS.

### STANDARD MANUFACTURING CO.,



Standard, Acme and Domestic Egg Beaters.

Also, Housefurnishing Goods generally. Circulars and samples on application.  
131 PORTLAND STREET, - - - - - BOSTON, MASS.

## BRASS PADLOCKS

IMPROVED PADLOCKS for Railway Switches and Freight Cars, used by many leading roads; also, Master Keyed Padlocks for Tool Houses, &c. The above made to order only, and have flat steel keys. Our well-known six and seven tumbler cast brass Padlocks, with or without Chain or Nickel plating, are handled to good profit by both home and foreign trade. We guarantee to make no two keys alike in a million. For security, durability and convenience, skilled mechanics say they have no equal.

D. K. MILLER LOCK COMPANY, Philadelphia, Pa.

C. W. DUNLAP & CO.,  
43 Chambers St., N. Y.GARDEN TOOLS  
AND  
Housekeeping Hardware.Established  
1855.

KEYSTONE WORKS.

Centennial Award  
1876.

### GEORGE GRIFFITHS, MANUFACTURER OF



Shovels, Spades, Scoops,  
Coal Hods, &c.,

Nos. 511, 513 and 515 LOCUST ST.,  
PHILADELPHIA, PA., U. S. A.

Send for Price List



## Ericsson's Latest Invention.

Experiments with Capt. Ericsson's iron torpedo boat destroyer, built at the Delamater Iron Works, recently occupied the attention of officers at the Brooklyn Navy Yard for several consecutive days. Full reports will be forwarded to Washington. The effort was to strike a submerged target of netting with a projectile formed of a wooden log, 15 feet in length, corresponding in dimensions with the missile to be used in warfare. The latter, in most instances, was placed 300 yards away, and the log usually spent its force about 300 yards beyond. Sometimes the largest was penetrated, but more frequently the missile went astray, in one instance burying itself in the mud. The Destroyer is an iron boat with hull almost entirely submerged. Upon this hull, placed well aft, is a deckhouse of sheet iron. The hull is 130 feet long, 12 feet wide and 11 feet deep. She is a double-ender, and is propelled by an engine of 1000 horse-power. The steering apparatus and the torpedo gun—in fact, all of her effective appointments—are below the water level. The armament consists of a single gun placed just above the keelson in the forward part of the boat, its muzzle opening directly into the water, which is excluded from it by a permanent valve hung by an elbow-joint to the stem, and opened or closed by a piston operated at the breech of the gun. When the gun is to be fired the valve is raised out of the path of the projectile and its place is taken by a temporary valve of wood or rubber cloth, which fits the muzzle tightly and is placed in the gun after it is loaded. This is shattered when the gun is fired. As the projectile leaves the muzzle the permanent valve again comes in position, the little water that rushes in runs through the breech to the bilge and is pumped out by a steam syphon. The torpedo which it is proposed to use in actual warfare is a chamber of iron or copper, large enough to contain 340 pounds of dynamite, and it is claimed that against this little vessel the most powerful ironclads will be helpless, as the submerged gun will penetrate them beneath their armor, and her great speed and facility of maneuvering would enable her to get in her work among a fleet of big ships almost at will and with entire safety.

## How Lost Cars are Traced.

The following is from an interesting article in the Philadelphia Press:

Travelers up and down any line of railway see daily hundreds of fugitive freight cars extending in broken lines along the side tracks and reaching many miles out of the city. They belong to a hundred different railway companies, each bearing the initials of the proprietary road, and in the general office of the company, whether it be in New York, Pittsburgh or San Francisco, there are records that show just where that car is standing and why it is there. For instance, if the car is detained an unwarranted length of time at Germantown Junction, the Pennsylvania Railroad receives a "searcher," either by telegraph or train service, asking why the car is not sent home. In this way a great railroad stretching half way across the continent, and with its rolling stock scattered over every State in the Union, keeps an account of its stock, numbering, in the case of the Pennsylvania Railroad, more than 30,000 freight cars of all kinds. Occasionally one of the number is lost altogether, and then the complicated railway detective service is set at work. The last clue to its whereabouts is traced out, and in time the lost car is found somewhere between Texas and Montreal. As soon as a car is unloaded it should be started back to the road from which it came, but in New England they turn it over as the common property of the road, and it is run back and forth, carrying local freight. It is not an uncommon thing when a car is loaded and sent to an Eastern point that it is not again heard from for three or four months. In the meantime there are more than 100 clerks employed on the car accounts, and week after week searchers are sent out for the missing car. A fair idea of the magnitude of these accounts may be had from the fact that the entire movement over the Pennsylvania Railroad exceeds over 40,000 per day. Lost freight cars which were formerly hunted by traveling agents, are now traced by "searchers," official documents, which contain the number and description of the lost car, and the date at which it was last seen on the Pennsylvania road. These documents are forwarded in the wake of the car, receiving many official signatures on the way, and finally overtake an agent who has the car in charge.

A fire started a short time ago under the counter of a prominent drug store on Chestnut street, Philadelphia. A cool-headed clerk, remembering the soda-water fountain, sent promptly to the cellar for a piece of india rubber gas tubing, and slipping one end of this over the nozzle of the soda fountain faucet, turned on the tap, and immediately he had a powerful head of water highly charged with carbonic acid gas, the first dash of which on the fire put it out entirely.

Six engine houses built in the heart of San Francisco to operate cable roads aggravated the "smoke nuisance" to such an extent that a case was brought in the court for its suppression. Within the last few days Judge Evans, of the Superior Court, awarded damages to the plaintiff, who owns a dwelling adjacent to the engine house of the California Street Railroad Company.

## TINIUS OLSEN & CO., STANDARD SCALES AND TESTING MACHINES.

Manufacturers of Olsen's Little Giant Testing Machine, and Improved Railroad, Wagon and Furnace Chugging Scales.  
Office and Works, N. W. cor. 19th and  
Buttwood Sts., Philadelphia.

This Advertisement Changed Weekly.

## IOWA BARB WIRE COMPANY,

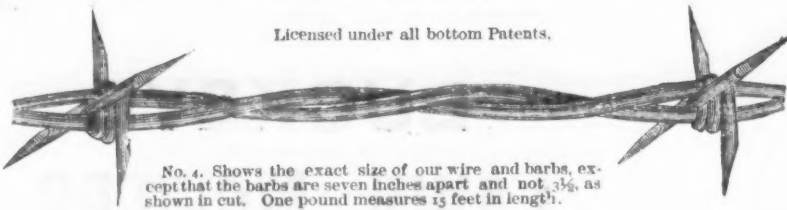
99 John Street,  
NEW YORK.

Factory,

JOHNSTOWN, PA.

89 Lake Street,  
CHICAGO.

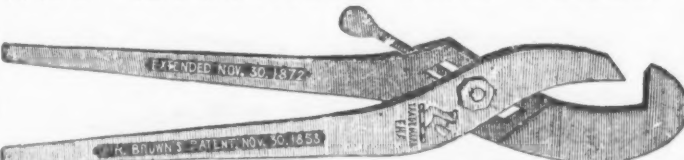
Licensed under all bottom Patents.



No. 4. Shows the exact size of our wire and barbs, except that the barbs are seven inches apart and not 3½, as shown in cut. One pound measures 15 feet in length.

## BROWN'S ADJUSTABLE PIPE TONGS.

Made from  
best se-  
lected  
Iron.



Address **The Ashcroft Mfg. Co.,**  
111 LIBERTY STREET, NEW YORK.

## HARRISON BOILER "THE SAFEST."

Adapted for All Steam Purposes.



Merits have been proved during ten to fifteen years, constant use by such concerns as Cheney Bros., S. Manchester, Conn.; Wallace & Sons, Ansonia, Conn.; Wampanoag Mills, Westmore Mills, Sagamore Mills, Fall River, Mass.; Sears Building, Boston, Mass.; Brown & Sharpe Mfg. Co., Providence, R. I.; A. T. Stewart & Co., Tiffany & Co., New York; Stevens Institute, Hoboken, N. J.; Matthiessen & Wicher's Sugar Refinery, Jersey City, N. J.; Wm. Sellers & Co., S. S. White, Daniel Allen, Jno. Gardiner & Co., Phosphor-Bronze Smelting Co., Henry Bower, Evening Bulletin, Saturday Night, Philadelphia, Pa., and numerous others.

Franklin Institute medal awarded for superiority of evaporative efficiency, economical capacity for generating steam and dynamic value of steam. Easily transported on mule back.

Send for descriptive catalogue.

HARRISON BOILER WORKS, 15th and Wood Streets, Philadelphia, Pa.

## DOG COLLARS and FURNISHINGS.

Celluloid,  
Chain,  
Leather,  
and Metal  
Dog Collars.  
96 Duane St.,  
New York.  
Near B'way.



Locks,  
Leads,  
Bells,  
Couplings,  
Harness, &c.

MEDAL OF SUPERIORITY, Nov., 1881.



**IVES' PATENT**  
Burglar-Proof Door Bolts.  
For sale by leading Hardware Jobber  
throughout the country.

**HOBART B. IVES,**  
Sole Manufacturer and Patentee,  
187 St. John Street,  
NEW HAVEN, CONN., U. S. A.  
Send for Illustrated Price List.



**CLEVELAND**  
**IRON ORE PAINT COMPANY,**  
Manufacturers of  
**PURE IRON ORE PAINTS,**  
Red (Rustic) Purple and Brown.  
We guarantee all our Paints, and respect-  
fully solicit the patronage of consumers and  
dealers.  
Office, 79 Columbus St., Cleveland, O.

**BEST**  
**IRON**  
**PAINT.**



**RIEHLÉ BROS.**  
STANDARD  
**SCALES**  
AND  
TESTING  
MACHINES

Railroad and Ware-  
house Trucks.

**PHILADELPHIA,**  
50 South 4th St.  
**NEW YORK,**  
115 Liberty Street.  
**PITTSBURGH,**  
Liberty St., cor. 7th av.  
**ST. LOUIS,**  
609 North Third St.  
**NEW ORLEANS,**  
142 Gravier Street.

## PURE TURKISH EMERY,

Quartz, Pumice and Rotten Stone, Crocus, Rouge, Glue, Sand  
Paper, Emery Paper and Cloth, Emery Wheels, &c.

**WALPOLE EMERY MILLS,**  
Mills, So. Walpole. 114 MILK ST., BOSTON, MASS.

## PHOSPHOR-BRONZE! PHOSPHOR-TIN!

Phosphor-Bronze is daily gaining favor with manufacturers who have to use a metal of great toughness and durability, of fine grain, high tensile strength and ductility, and is acknowledged far superior to any other alloy on account of the readiness with which it takes a polish, its elasticity, fluidity and beauty of color. Its high price, however, has so far prevented the use of it to so large an extent as its merit would warrant. For the first time an article is offered herewith which makes it easy for everybody to manufacture his own Phosphor-Bronze of the grade it is wanted, by the simple process of melting. This article is **PHOSPHOR-TIN**. By melting a very small quantity of it with copper an excellent Phosphor-Bronze is obtained at a much cheaper price than the ready made Phosphor-Bronze can be had in the market. A trial ought to be made by everybody who is using it.

**A. KAUFMANN,** 36 Park Place, New York,  
Sole Agent for the United States and Canada.  
For pamphlets please address the above, P. O.  
Box 210, New York.

## Bergen Port Spelter.

MINES: WORKS & FURNACES  
Lehigh Valley, Pa. Bergen Port, N. J.  
The only Miners and Manufacturers of

**PURE**  
**LEHIGH**

**SPELTER**  
From Lehigh Ore.

Especially adapted for  
Cartridge Metal and German Silver.

Also manufacturers of  
**BERGEN PORT OXIDE ZINC.**  
superior for LIQUID PAINT on account of its body  
and wearing properties.

**BERGEN PORT ZINC CO.**  
**E. A. FISHER,** Agent, 13 Burling Slip, N. Y.

## BUCKEYE LAWN MOWER.

THE **"BUCKEYE" JUNIOR**  
LAWN MOWER

SENIOR 1  
AND  
JUNIOR

"BUCKEYE"

LAWN MOWERS.

Most Reliable, Compact,

EASY WORKING,

Durable and Efficient

Mower in the Market.

Send for descriptive circular.

AGENTS:

EVERETT & SMALL, Boston, Mass.  
H. B. NEWHALL, New York, N. Y.  
CHAS. H. GEORGE & CO., Providence, R. I.  
LOEBLER & LADD, Buffalo, N. Y.  
J. M. CHILDS & CO., Utica, N. Y.  
DUFF & McKEAN, Pittsburgh, Pa.  
McINTOSH, GOOD & CO., Cleveland, Ohio.  
ROGERS, ENGLE & CO., Dayton, Ohio.  
BRINTNALL, LAMB & CO., Chicago, Ill.  
BLACK & OWEN, Detroit, Mich.  
PAPPENHEIMER HDW. CO., Cincinnati, Ohio.  
VAJEN & NEW, Indianapolis, Ind.

J. & J. A. RICE, Worcester, Mass.  
SEMPLE, VALLE & BURKHARD CUTLERY CO.,  
St. Louis, Mo.  
DEERE, MANSON & CO., Kansas City, Mo.  
W. J. KINNEY, Denver, Col.  
GEO. A. LOWE, Salt Lake, Utah.  
D. E. GOLDSMITH, San Francisco.  
P. P. MAST & CO., Philadelphia, Pa.  
MAST, FOOS & CO., St. Louis, Mo.  
J. DAULTON, Paris, France.  
MAST, FOOS & CO., Liverpool, Eng.

Correspondence solicited, and full information, with circulars, furnished on application to  
**MAST, F S & CO.,** Springfield, Ohio, U. S. A.

## The Iowa Farming Tool Company,

MANUFACTURERS OF

**FORK, HOE AND RAKE HANDLES,**

FOR THE JOBBING TRADE.

Fort Madison, - - - Iowa.

## PATENT ROOF BRACKET,

NO HOLES, NO DANGER.

For Carpenters, Painters,  
Masons and Firemen.

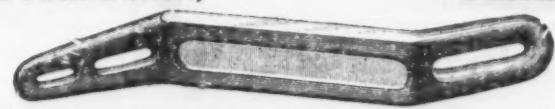
The shingle on this side being left out, the operation of the Bracket can be easily seen. It slides in between two shingles, with the foot slightly raised, two ears going under the shingles and two over; when the foot is pressed down the ears take a lever nip on the shingles, which, with the spur on the foot, makes it impossible for the bracket to come off.

MADE BY

**WILDER MFG. CO.,**  
Gardner, Mass.

FOR SALE BY HARDWARE DEALERS GENERALLY,  
**WILLIAM BLAIR & CO.,** Chicago; **HOWELL, GANO & CO.,** Cincinnati,  
Wholesale Western Agents.

**H. H. COLES & CO.,**  
446 North Twelfth Street, PHILADELPHIA.



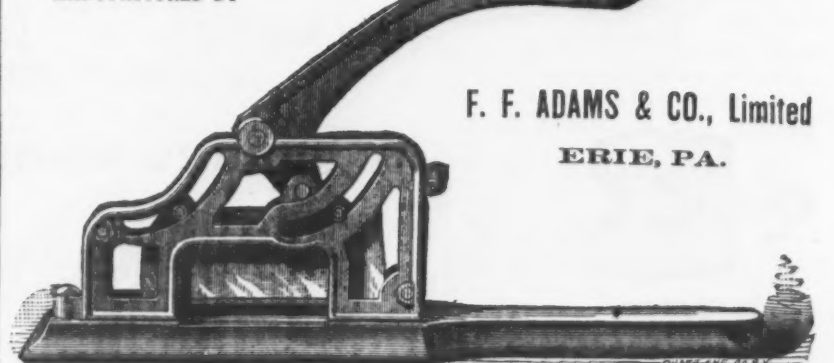
**NEW CHUCKING DRILL REST.**

It will hold all sizes of drills up to 1¼ inches.

Price 60 Cents.

## ACME TOBACCO CUTTER, No. 10.

MANUFACTURED BY



**F. F. ADAMS & CO., Limited**  
ERIE, PA.

## Stanley Rule & Level Co.,

MANUFACTURERS OF

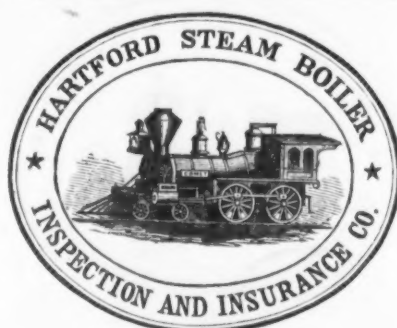
**Improved**  
**Carpenters'**  
**Tools.**



FACTORIES  
New Britain, Conn.  
WAREHOUSES,  
29 Chambers St.,  
New York.

Manufacturers of Bailey's Patent Adjustable Planes.  
General Agents for the sale of Leonard Bailey & Co.'s "Victor Planes."  
Manufacturers of "Bodance" Patent Adjustable Planes.





Issues Policies of Insurance after a careful inspection of the Boilers  
COVERING ALL LOSS OR DAMAGE TO

**Boilers, Buildings and Machinery.**

ARISING FROM

**STEAM BOILER EXPLOSIONS.**

The Business of the Company includes all kinds of STEAM BOILERS.

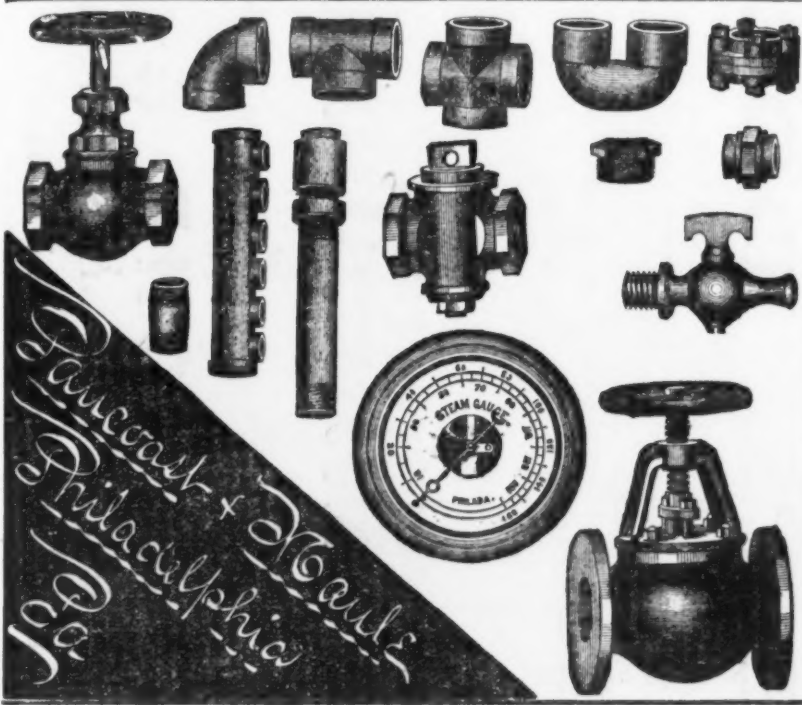
Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

**Board of Directors:**  
J. W. ALLEN, President. LUCIUS J. HENDER, Pres't Fina Fire Ins. Co. FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silk Manufacturing Co. CHARLES W. BEACH, of Beach & Co. DANIEL PHILLIPS, of Adams Express Co. GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank. RICHARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co. THOMAS O. ENDERS, Sec'y Fina Life Ins. Co. LEVERETT BRAINARD, of Case, Lockwood & Brainard.  
GEN. W. B. FRANKLIN, Vice Pres't Colt's Pat. Fire Arms Mfg. Co. GEO. CROMPTON, Crompton Loom Works, Worcester. WILLIAM ADAMSON, of Baeder, Adamson & Co., Philadelphia. HON. THOS. TALBOT, Ex-Governor of Mass. NEWTON CASE, Case, Lockwood & Brainard, Hartford. WILLIAM S. SLATER, Cotton Manufacturer, Providence, R. I. NELSON HOLLISTER, of State Bank, Hartford. D. R. SMITH, Pres't Springfield Fire & Marine Ins. Co.



**PENFIELD PULLEY BLOCK CO.**  
LOCKPORT, N.Y.

**HENRY B. NEWHALL,**  
105 Chambers Street,  
NEW YORK AGENT.

**S. H. & E. Y. MOORE,**  
163 & 165 Lake Street  
CHICAGO AGENTS.

**JOHN S. FRAY,** Successor to FRAY & PIGG, Bridgeport, Ct.



**Spofford Bit Brace.**

The Spofford Bit Brace is made under Letters Patent of the U. S. A., granted to N. Spofford, March 23, 1880, assigned to Fray & Pigg, and now held by John S. Fray, Mr. Pigg having retired from the firm.

All Iron, Five Sizes.		Cocobolo Head and Handle. Sleeve Brace.	
No. 2.....7 inch sweep.	No. 107.....7 inch sweep.	No. 70.....7 inch sweep.	No. 120.....12 inch sweep.
No. 8.....10 "	No. 108.....8 "	No. 80.....8 "	No. 121.....12 "
No. 10.....12 "	No. 110.....10 "	No. 100.....10 "	No. 122.....12 "
No. 12.....14 "	No. 112.....12 "	No. 120.....12 "	
No. 14.....14 "			

**SANFORD'S PATENT OX SHOE**

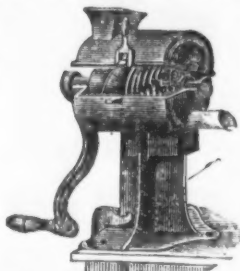


Is the only shoe that will not lame an ox, which he can stand up square upon, and will prevent slipping. Six sizes. Liberal discount to dealers. Manufactured by

**SHADBOLT, BOYD & CO., Milwaukee, Wis.**

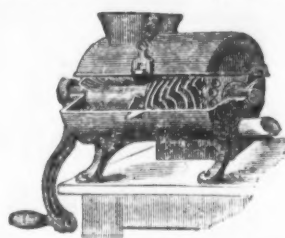
## Kieser's Gem. Kieser's No. 55

Double  
Shearing  
Cut.  
Solid  
Cast  
Steel  
Blades.



Patented Sept. 14, 1880.

**Family Meat Cutters are the best made.**  
Every family should have one. Will thoroughly cut Raw or Cooked Beef or Pork, Vegetables, Coconuts, Pine Apples, &c. Will cut forty pounds sausage meat an hour.  
Every Druggist should have one for cutting Roots, Vanilla Beans, &c.  
Easily worked. Easily cleaned. Will not get out of order. Ask your dealer for them.  
Send a postal for Circular with testimonials.  
Will send one as sample by express upon receipt of \$2.00.



Are Made on the Same Principle as the Gem Meat Cutters,

But with capacity to cut 100 pounds Pork an hour.

Will send one as sample on receipt of \$3.00.  
Our No. 1 Butcher, for hand or power will cut 300 pounds an hour.  
Our No. A Butcher for power, will cut 1000 pounds an hour.  
We warrant our Cutters to do the work more thoroughly than any other machine made.

Also Sole Manufacturers of

**KIMBALL'S PATENT SHOVELS & SPADES,  
BOSS PATENT MOLASSES GATES,  
LOCKWOOD'S PATENT HOES.**

**KIMBALL SHOVEL CO.,**

Office, No. 67 German St., Baltimore, Md.

THOMPSON McCOSH, Pres.

ROBERT DONAHUE, Treas.



**PHILADELPHIA SCREW CO., Limited,**  
Twelfth and Buttonwood Streets, PHILADELPHIA.

Manufacturers of

**IRON & BRASS WOOD SCREWS.**



Quality, finish and tests as to strength guaranteed equal to any in the market.

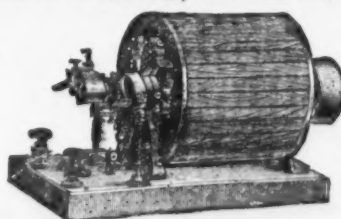
With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts. A full line in stock.

**The American Dynamo-Electric Machine,**  
For Electro-Plating, Electrotyping, &c.

Requires no Water.

Combining

all the



Latest

Improvements.

Cannot Reverse

Current.

**ZUCKER & LEVETT, Genl. Agents,**

Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.

540, 542 & 544 WEST 16TH STREET, N. Y.

**WASHERS.**



**WASHERS.**

Cuyahoga Falls,  
Ohio.

Tinned  
Belt Rivets  
AND  
Burrs a Specialty.

**HUNDLEY & HANKS,**  
PROPRIETORS OF  
**NORTH CAROLINA HANDLE CO.,**



MANUFACTURERS OF  
**Handles and Spokes,**  
70 Rende Street and 97 Chambers Street, NEW YORK.  
HARDWARE COMMISSION MERCHANTS.



**THE PERFECTION  
WINDOW CLEANER CO.**

are owners of every patent covering rubber window cleaning devices. Our manufacturing facilities are large, allowing us to undersell cheap and worthless infringements.

We mail sample Rubber Cleaner to all Dealers soliciting.

**TRY OUR CLEANER.**

Its perfection saves 80 per cent. time cleaning Plate Glass, and must become as staple as mops and brooms.

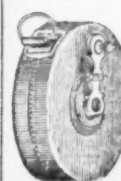
A. F. CONANT, 3 Finsbury St., London, European Agent.

Rubber, Woodenware and Fancy Hardware Dealers generally keep our Cleaners.



**Perfection Window Cleaner Co.,**

167 Madison St., Chicago.



**GEO. M. EDDY & CO.,**

Manufacturers of

**Measuring Tapes**

Of Cotton, Linen & Steel.

ALL PURPOSES.

351 to 353 Cresson Ave., Brooklyn, N.Y.

**FINE WOOD PHOTO ENGRAVING**  
SEND COPY FOR ESTIMATE. CROSSCUP & WEST. IT WILL PAY YOU 702 CHESTNUT PHILA. PA.

**Grindstones, Emery, &c.**

**Walter R. Wood,**  
**GRINDSTONES.**

Berea, O., Nova Scotia, & other brands.  
983 and 985 Front Street, New York.

**GEO. CHASE,**

The largest manufacturers in the world of

**OIL STONE**

Of all description.

107th Street and Harlem River,  
Send for Illustrated Price List. NEW YORK.

**NEWCASTLE GRINDSTONES**

(ENGLAND).

Celebrated for their uniform quality and keen rasping grit, have now a world-wide reputation.

For prices apply to

**R. ATKINSON & CO.,**

Manufacturers,  
Office, Guildhall, Newcastle-on-Tyne.



**McDERMOTT & BEREA STONE CO.,**  
Manufacturers of  
**GRINDSTONES,**  
Cleveland, Ohio.

**EMERY.**

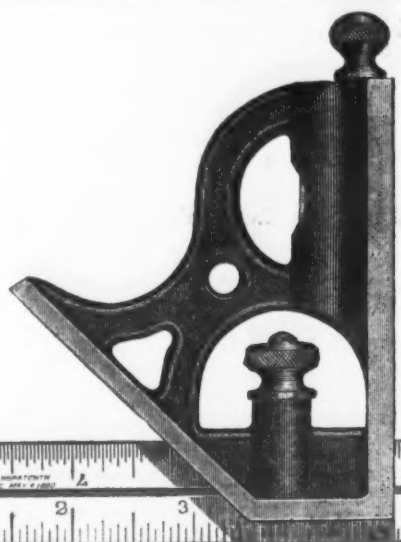
Large stock on hand, especially suited to Saw and Shovel Manufacturers, at bottom prices.

Importers and Manufacturers of  
**PURE TURKISH EMERY.**

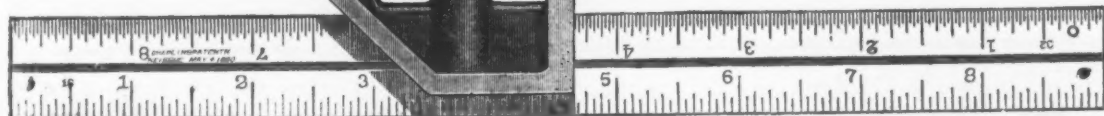
**IRVINE, TOWNSEND & CO.**  
123 Chambers St., New York.

Send for quotations and samples.

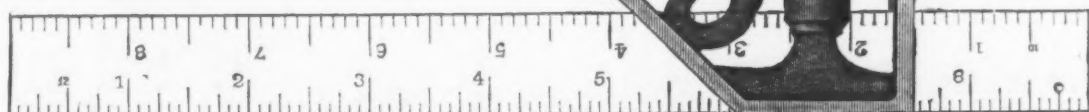




CHAPLIN'S PATENT  
TRY SQUARE AND MITRE, SPIRIT  
LEVEL AND PLUMB.



CENTER SQUARE  
AND  
DRAUGHTSMAN'S T-SQUARE.



STANDARD TOOL COMPANY,  
ATHOL, MASS.,

Sole Manufacturers and Owners of the Patent.

Circular, with Price List and Discounts, on Application.

WILEY & RUSSELL MANUFACTURING CO., Greenfield, Mass.,  
Lightning Screw-Cutting Machinery and Tools.



Lightning Screw Plates and Bolt Cutters,  
Green River Drilling Machines,  
Green River Tire Wenders,  
Green River Tire Upsetters,  
Green River Horse Shoers' Vises,  
Green River Tire Wheels.

Special Screw Plates for the use of Model Makers, Carriage Makers, Blacksmiths and others. Taps, Dies and Reamers for use with the Bit Brace. Tire Bolt Wrenches, Nut Wrench, Screw Plates for threading gas pipe.

Send for Illustrated Price Lists and Circular.

Agents in London, England, Messrs. Selig, Sonnenthal & Co.

THE HARTFORD HAMMER CO.,

MANUFACTURERS OF

SOLID CAST STEEL  
HAMMERS,

Adze Eye and Bell Faced Nail Hammers, Machinists' and Blacksmiths' Hammers.

The attention of the trade is called to this line of goods as superior in style, quality and workmanship to any in market.

Hartford, Conn., U. S. A.  
For Sale by C. E. JENNINGS & CO., 96 Chambers St., New York, and the Trade generally.

HOOSIER SAW WORKS.

W. B. BARRY, Indianapolis, Ind.

Circular Saws.

I use none but best refined cast steel, selected. All saws subjected to a careful examination before shipment.

A trial of our goods will satisfy the purchaser of their excellence.  
Send for catalogue.

THE GLOBE MANUFACTURING CO.,  
Successors to THE MIDDLETOWN TOOL CO.

HARDWARE,

"Baldwin" Plane Irons.

(Every Iron of our make warranted a perfect cutter.) ALSO,

Galvanized Hammock or Boat Snaps and Gaff Topsail Self-mousing Ship Hooks, Har-

ness Snaps, Baby Snaps, Washer Cutters, Pocket Wrenches, Amateur Lathes, &c.

MIDDLETOWN, CONN.

Send for Catalogue and Discount Sheet.

GRANVILLE  
HYDRAULIC ELEVATOR COMPANY,  
Offices No. 1193 Broadway,  
NEW YORK.

Hydraulic Elevators for Passengers or Freight.  
Hydraulic Double-Acting Dumb Waiters. Hy-  
draulic Sidewalk Elevators. N. B.—Steam Eleva-  
tors altered to Hydraulic Elevators.

FOUNDRYMEN'S METALLIC

Pattern Letters and Figures,  
To put on patterns of castings. All sizes. Re-  
duced prices. Mfd. by H. W. Knight Seneca Falls, N.Y.

MOHR'S DOOR SPRING.



CORRESPONDENCE SOLICITED. PRICE LOWER THAN EVER.

J. A. MOHR & CO., Sole Manufacturers,  
MANCHESTER, IOWA.

SAMPLE FREE TO THE JOBBING TRADE.

"I had to put sample away. I could not get rid of my Aurora Springs."—A. HEITCHER, Anamosa, Iowa.  
"They go like buckwheat cakes and honey in December."—JAMISON BUOS, Oelwein, Iowa.  
"Yours is the 'Boss Spring.' Is it not handled in St. Louis? If so, by whom?"—E. W. BMDILL, Chetopa, Kan.  
"We consider it the best Screen Door Spring in the market, and wish you success."—CLARK & AVERY, Cawker City, Kan.  
"I promised them a good spring, and this is the first imperfect one I have found in nearly 20 dozen which I have sold."—  
E. F. MANWIN, Waterloo, Iowa.

ELBA IRON & BOLT CO., Limited.

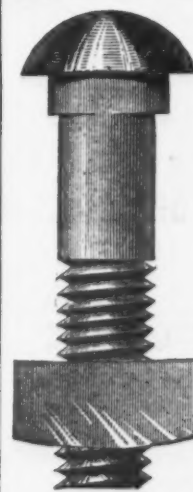
MANUFACTURERS OF

MERCHANT BAR IRON,

SKELP IRON, SPLICE BARS,

Railway Track Bolts, Car, Bridge and

Machinery Bolts, Nuts, &c.



We invite the attention of RAILROAD MEN especially, to our  
make of SPLICE BARS and Track Bolts. Using the best brands of  
REFINED IRON, and paying close attention to the finish of our  
manufactures, we are enabled to offer our patrons BOLTS, NUTS,  
SPLICE BARS, &c., of excellent quality.

Our works have been enlarged within a few years; all orders are  
now executed with promptness; all our work guaranteed.

SEND FOR PRICE LISTS AND INFORMATION TO

ELBA IRON & BOLT CO., Limited,

PITTSBURGH, PA.

CINCINNATI ROLLING MILLS AND CHAIN WORKS

Manufacture Trace, Coil, Ox, Log and Wagon Chain, Fifth Wheels, Shackles and King Bolts, using only  
Iron made at our mills from strictly selected Wrought Scrap.

OFFICE, 30 West Third Street.

MILLS & WORKS, Gess & C. H. & D. E. R.

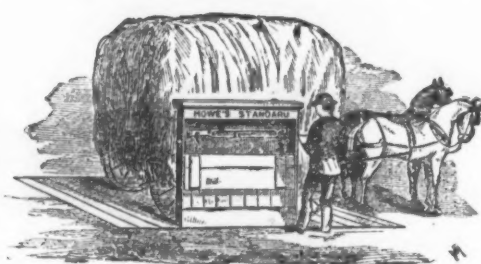


# THE IMPROVED HOWE SCALE

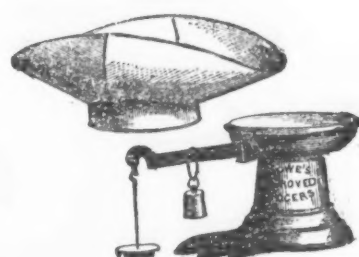
THE ONLY SCALE HAVING PROTECTED BEARINGS.



ADAPTED  
TO THE  
**Standards**  
OF ALL  
COUNTRIES.



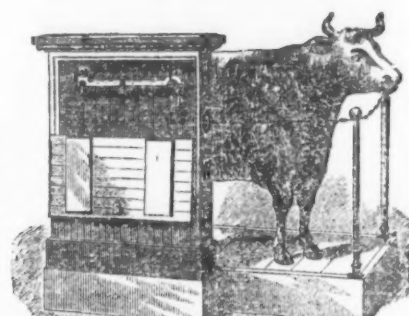
ADOPTED  
AND USED BY THE  
**U. S. CUSTOMS**  
DEPARTMENT.



MANUFACTURED BY THE

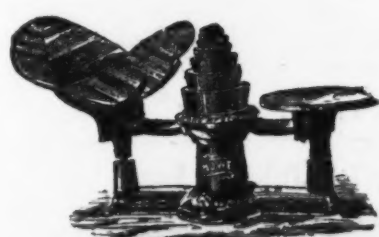
**HOWE SCALE COMPANY, Rutland, Vt.**

Established 1856.

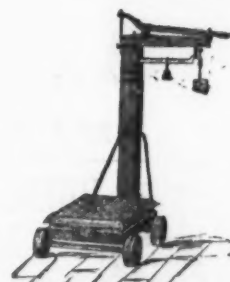


## PAGE, FARGO & CO.,

325 BROADWAY, NEW YORK, DEPOT FOR THE SUPPLY OF THE EXPORT TRADE.



CATALOGUES  
AND  
**PRICE LISTS**  
In any Language,



SENT FREE  
TO ANY  
ADDRESS  
Upon Application.



## THE HARTFORD COMPRESSED-AIR PUMP.

Water Driven to any Height and Distance by Compressed Air.

Country Houses Supplied Cheaply and Certainly for Bath Rooms, Water Closets, Hot and Cold Water Faucets, &c.

Plenty of Fresh Water for Stock on Farms.

The Best Pump for Irrigating, Supplying Railroad Tanks and for Mining Purposes.

This pump is being introduced into all the foreign countries, and is accepted by all mechanical men as the very best Pump in the market. It is more durable and needs less repairs than any other apparatus for like purposes, and is therefore the cheapest in the end, if not at first. Its advantages over other Windmills, Rams, and other contrivances for raising water, are quickly seen. For Circular and Price List address

**THE HARTFORD COMPRESSED-AIR PUMP CO.,**

EZRA BROOKS, Sec. and Gen'l Manager,

**HARTFORD, CONN., U. S. A.**



## PROVIDENCE STEAM TRAP COMPANY, Manufacturers of Newton's Patent Steam Trap, Compensating Valve, Oscillating Furnace Bars, and Furnace Economisers

R. NEWTON, C. E. M. E., Supt.

JOHN TURNER, Treas.

JOHN SHORE, Sec'y.

**To Manufacturers, Bleachers, Dyers, and all Users of Steam:** We wish to call your special attention to our PATENT STEAM TRAP, acknowledged by practical engineers and manufacturers to be the best, simplest, most effective and durable Trap ever brought before the public. The simplicity of this Trap consists of doing away with all expansions and contractions, no glands or stuffing boxes, or bolts of any description required: no compound cylinders and no copper rods. The cover can be removed at any time to see it work; and if required the discharged water can be elevated from two to thirty feet, so that it can be used for other purposes. They will last from thirty to forty years. As regards frost and snow it makes no difference, as we have had and still have one working in the open air at Washington Mills, Lawrence, Mass., and it has done its work well, never having had any trouble with it, and bids defiance to all weather. That they have been thoroughly tested can be seen by the testimonials given below, of the few that have come to hand:

### TESTIMONIALS.

Washington Mills, Lawrence, Mass., November 18, 1880.  
Mr. R. Newton.—DEAR SIR: The Steam Trap we bought of you last August works admirably. Please send us another as soon as possible. Yours truly,  
JAMES R. SINGER, Mech. Supt.

Clyde Bleachery and Print Works, River Point, R. I., January 17, 1881.  
Mr. R. Newton.—DEAR SIR: The Steam Trap we had of you is in successful and very satisfactory operation. Its simplicity in construction and undoubted durability will commend it to all who are in want of a superior Steam Trap. We shall order more when in need of any. Yours, truly,  
S. H. GREEN & SONS.

A. & W. Sprague Mfg. Co., Cranston Print Works, R. I., Jan. 15, 1880.  
Mr. Robert Newton.—DEAR SIR: The Steam Traps we bought of you work first-class and give every satisfaction, and appear to be very durable. We think them the best Steam Trap that we have ever had. When in want of more will write you. I remain, yours, truly,  
THOMAS BRISTOW, Supt. Cranston Print Works

Office of Washington Mills, Boston, December 24, 1880.  
Providence Steam Trap Co.—GENTLEMEN: Please forward to Washington Mills as soon as possible six (6) 1/2-inch Traps and send bill to me.  
Yours, truly,  
HENRY F. COE, Treas.

Kendall Manufacturing Co., Providence, R. I., Feb. 1, 1881.  
Providence Steam Trap Co.—GENTS: We have used one of your Steam Traps for some time and would say that we find it gives perfect satisfaction.  
Yours, truly,  
NICHOLAS SHELDON, Treas.

Providence, R. I., December 18, 1880.  
Mr. Newton.—DEAR SIR: We have your Steam Trap working satisfactorily, and can conscientiously recommend it to all. Yours, very truly,  
B. COLLINGHAM, Supt. Atlantic Mills.

ROBERT NEWTON, C. E. M. E., Inventor and Patentee, Providence, R. I.

### PATENT OSCILLATING FIRE BARS.

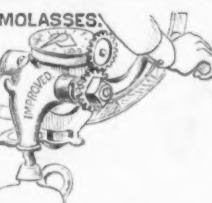
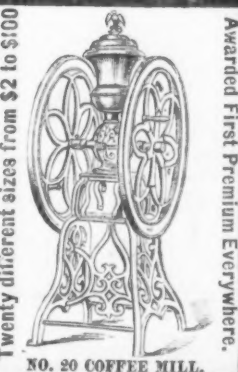
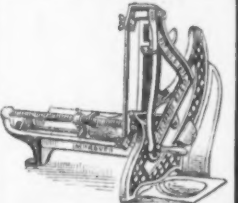

We wish also to call your attention to R. Newton's PATENT OSCILLATING FIRE BARS, which for durability, economy and application are acknowledged by all practical engineers that have seen them up to the present time to be the best ever brought before the public. This invention the patentee has labored at more or less since 1851. These bars have long been wanted, and their use will at once prove their efficacy as an economiser of fuel and labor. These bars can consume from four to twenty-six pounds of coal per square foot of grate, per hour, and not warp; and the apertures can be kept clean so that they can get a regular supply of oxygen, which is the life giving power of calorific. They can be applied to all kinds of boiler surfaces (except vertical), and can be fitted to the furnaces in about five hours. Testimonials can be forwarded, if required, to show that they are now in use in some of the largest firms in the world.

**SOME OF THE ADVANTAGES:** These bars allow the use of inferior coal; evaporating power is greatly increased. This is a great boon where boiler power and space is limited. This advantage cannot be over-estimated in the case of marine boilers. The oscillating of the fire bars both cuts and lifts the slug, and clears the apertures at the same time. The bars give four motions in one oscillation, and cannot get out of order. They are also free of expansion and contraction, both longitudinal and transversal, and however careless the stoker may be he cannot leave them so as to take any harm. They are so cast, and of such metal, that they are the most durable bar ever brought into use. All now in use are very much approved. They are very simple and cannot get out of order. Their cost is so reasonable that they come within the reach of all. The company are now granting licenses to several firms to make and apply them, and are open to arrange with other parties. N. B.—The company furnish first sets of models.

Agents wanted for different locations.

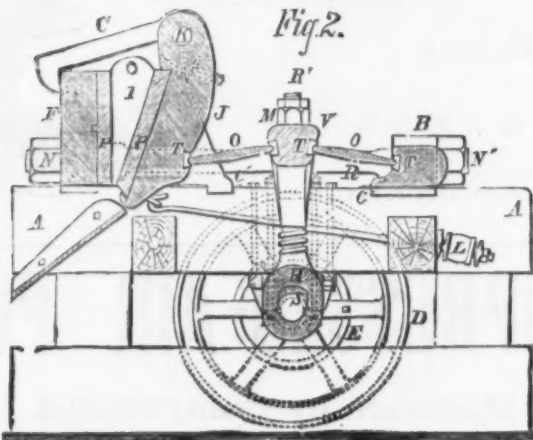
All communications should be addressed to PROVIDENCE STEAM TRAP CO., P. O. Box 1213, Providence, R. I.



 Fruit, Wine & Jelly Press.	 SAUSAGE STUFFER.	 MOLASSES. Self-Measuring Faucet.
 Twenty different sizes from \$2 to \$100. Awarded First Premium Everywhere. NO. 20 COFFEE MILL.	<b>ENTERPRISE MANUFACTURING CO. OF PA.,</b> THIRD & DAUPHIN STS, PHILADELPHIA, PA.	
	 Tincture Presses, Self-Weighing Cheese Knife, Cork Presses. <b>THE BEST ARE THE CHEAPEST.</b> MRS. POTTS' Cold Handle Double Pointed Sad Irons. SOLD BY HARDWARE DEALERS. SEND FOR ILLUSTRATED CATALOGUE, FREE.	
 Smoked Beef Shaver.	 SAUSAGE CUTTER.	 Bung Hole Borer.  Tobacco & Root Cutter.

## THE NEW BLAKE CRUSHER. OR, BLAKE'S CHALLENGE ROCK BREAKER.

Patented Nov. 18, 1879.



The most economical and reliable Crusher in use. Superior in all respects to our old style Blake Crushers, and rapidly superseding them and all imitations. For railway ballast, Macadam road making, and crushing of ores of all kinds it has no competitor.

This machine dispenses with cast iron frame and pitman of our old forms. All strains are on wrought iron or steel.

Awarded medals of superiority by judges of American Institute Fair, New York City, 1879 and 1880, where it was exhibited in competition with our old forms of Crusher. Address,

**BLAKE CRUSHER CO.,**  
Sole Makers,  
NEW HAVEN, CONN.

### QUARTZ MILLS & MINING MACHINERY.

W. H. BOWER, Mechanical Engineer, Salt Lake City, Utah.  
General Western Constructing agent for  
GRIFFITH & WEDGE, mfrs. of Mining and Milling Machinery, Zanesville, Ohio, and  
the BUCKEYE ENGINE CO., mfrs. Buckeye Engine, Salem, Ohio.

#### MINER'S PROSPECTING ENGINE.

Over fifty now in actual use; weight of boiler and engine complete only 400 lbs.; will hoist from a vertical shaft 250 lbs.; just the engine you want to prospect a mine 40 to 500 feet in depth.

California Combination Amalgamating Pans, Belted Settlers, Gold and Silver Mortars for both wet and dry crushing, Revolving Roasting and Chloridizing Furnaces; Revolving Dry Kilns, a new feature in mills; Buckeye Automatic Cut-off engines, Pumping Engines, Air Compressors, Rock Drills, Portable Engines and Saw Mills, Cornish Pumps, Steam Pumps, Mining Cars, Blake Crushers, Centennial Mining Cogs, with safety catch attached.

I am prepared to contract for the construction of Quartz Mills and Hoisting Works, in any part of the Pacific Coast.

The houses I represent are the only parties having my plans of Quartz Milling and Mining Machinery, and are the only shops east of San Francisco that can build a genuine Quartz Mill, adapted to work all the various kinds of base and refractory ores. Address all communications referring to mill and mining machinery to

W. H. BOWERS,  
101 Main St., Salt Lake City, Utah.

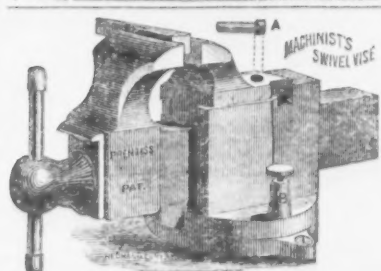
### PRENTISS' PAT. VISES.

Adjustable Jaw.  
Stationary and Pat. Swivel Bottoms.  
Adapted to all kinds of Vise Work.

Sold by the Trade.

**PRENTISS VISE CO.,**  
23 Dey Street, New York,  
Sole Proprietors.

Send for circular



# CHAINS

MILLER CHAIN CO., Akron, O.  
Coil, Cable, Crane, and  
Agricultural Chains.

## DOUBLE ACTION RATCHET SCREW DRIVER.

ONE OF THE VERY BEST TOOLS EVER INVENTED.

It combines greater Strength, Convenience and Durability than was ever obtained in a Common Driver. Sells readily and gives Perfect Satisfaction.



Trade supplied by the principal Jobbers throughout the U. S. or by the manufacturers,

**GAY & PARSONS,** - - - Augusta, Maine.

SEND FOR PRICE LIST.

## B. FITTS' PATENT MAGNETIC METAL SEPARATOR.

### MAGNETIC METAL SEPARATOR.

The accompanying cut represents a view of a recently invented machine for separating iron turnings, filings, &c., from brass, composition and other material. Its capacity and utility for this kind of work surpasses anything ever before offered to the public, doing its work most thoroughly, and with the least amount of labor or trouble. The machine is not only a great labor-saving device, but brass stock treated with it is much improved, as it is thoroughly cleansed that it may be used for the best of work.

The machine may also be used for separating iron from emery.

#### TESTIMONIALS.

From the Walworth Manufacturing Co., Boston.

Boston, Jan. 18, 1880.  
Mr. Ezra Sawyer, Worcester: Of the many methods we have practised in separating iron from brass turnings and filings, we have found none equal to your machine. Very truly yours,  
E. C. HAMMER, Treas.

From the Benedict and Dursham Mfg. Company, Waterbury, Conn.

Waterbury, Conn., Aug. 19, 1879.  
Ezra Sawyer, Esq., Worcester—DEAR SIR: We have used one of B. Fitts' Patent Magnetic Metal Separators for eighteen months, and can recommend it as the best thing we have ever seen for separating metals, and have no doubt it has more than paid for itself in its use. UNION WATER METER CO.  
Worcester, Sept. 1, 1879. J. C. OTIS, Treas.

From Peck Brothers & Co., New Haven, Conn.

New Haven, Conn., Sept. 3, 1879.  
Ezra Sawyer, Esq.—DEAR SIR: We are pleased to inform you that the machine we purchased of you for cleaning our turnings and sweepings works admirably, and does its work thoroughly. It will very soon earn all it cost us. Respectfully yours,  
J. M. PECK, Treas.

From Rice, Barton & Feltz Machine and Iron Co., Worcester, Mass.

Worcester, Mass., Sept. 4, 1879.  
Ezra Sawyer, Esq., Worcester—DEAR SIR: We have used your Magnetic Metal Separator several months; it works to our satisfaction, and we cheerfully give it our recommendation. Yours truly,  
H. VAN DUSEN, Agt. BROWN & BROTHERS.

From Peck Brothers & Co., New Haven, Conn.  
New Haven, Conn., Sept. 3, 1879.  
Ezra Sawyer, Esq.—DEAR SIR: We are pleased to inform you that the machine we purchased of you for cleaning our turnings and sweepings works admirably, and does its work thoroughly. It will very soon earn all it cost us. Respectfully yours,  
J. M. PECK, Treas.

From Rice, Barton & Feltz Machine and Iron Co., Worcester, Mass.

Worcester, Mass., Sept. 4, 1879.  
Ezra Sawyer, Esq., Worcester—DEAR SIR: We have used your Magnetic Metal Separator several months; it works to our satisfaction, and we cheerfully give it our recommendation. Yours truly,  
H. VAN DUSEN, Agt. BROWN & BROTHERS.

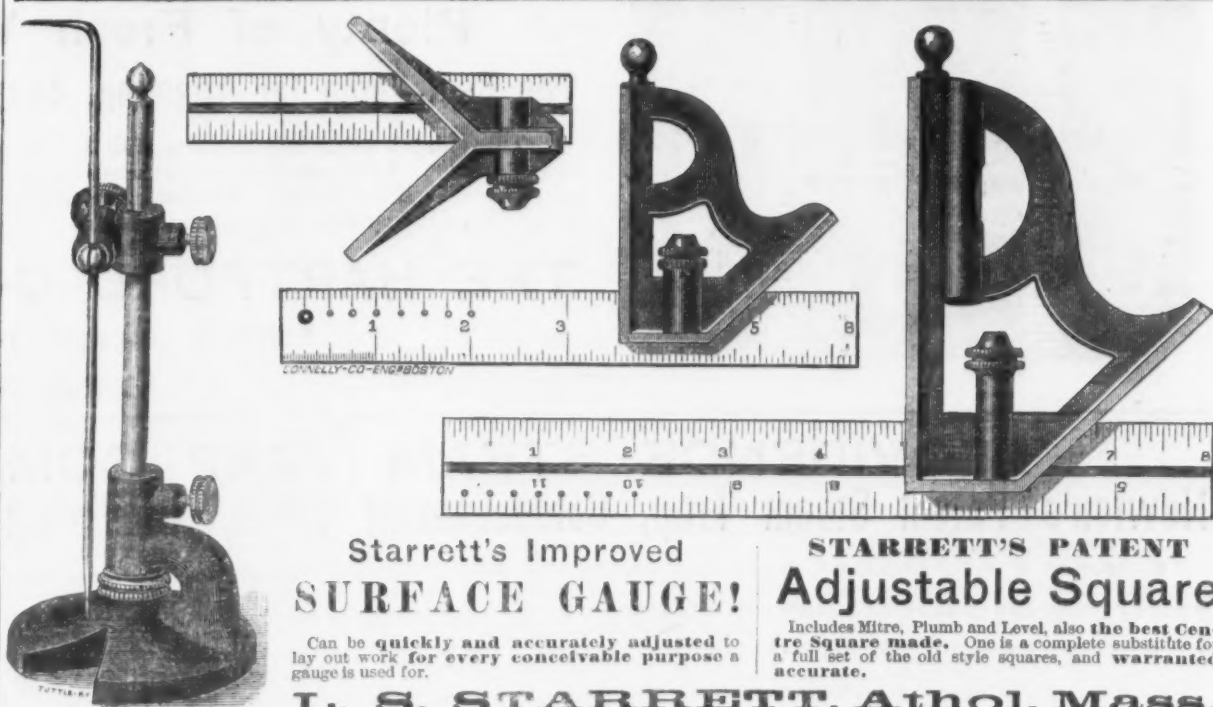
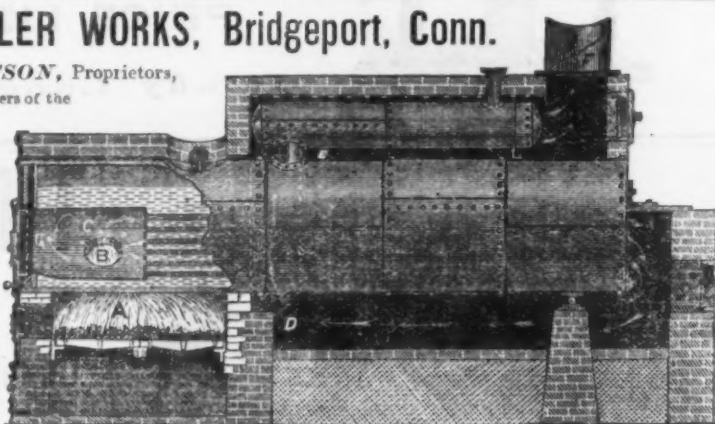
Manufactured by  
**EZRA SAWYER, 33 Hermon Street, WORCESTER, MASS.**

## BRIDGEPORT BOILER WORKS, Bridgeport, Conn.

LOWE & WATSON, Proprietors,  
Manufacturers of the

### Lowe Patent TUBULAR BOILER.

Fourteen years' use proves them the most desirable and reliable boiler known. Gives dry steam. The process for the construction of the boiler is in the construction and setting. Burns any fuel; obtains as much heat from it as any boiler or setting, with no more cost and greater durability. Send for descriptive circular.



### Starrett's Improved SURFACE GAUGE!

Can be quickly and accurately adjusted to lay out work for every conceivable purpose a gauge is used for.

### STARRETT'S PATENT Adjustable Square

Includes Mitre, Plumb and Level, also the best Centre Square made. One is a complete substitute for a full set of the old style squares, and warranted accurate.

**L. S. STARRETT, Athol, Mass.**  
PATENTEE AND SOLE MANUFACTURER.

Send for Catalogue.

## JACK SCREWS,

Press Screws, &c.,

Cast with Perfect Seamless Thread by our New Patent Process.

Cheaper than Wrought Iron, not so apt to Bend or Strip the Thread.

LIBERAL DISCOUNT TO THE TRADE.

**SEECER MFG. CO.,** Box 1513, Springfield, Mass.  
H. E. ASHCRAFT, Agt., 12 Murray St., & 15 Park Place, New York.





# The Iron Age Directory

## and Index to Advertisements.

AGRICULTURAL IMPLEMENTS.	PAGE
Grant Farm Tool Co., Fort Madison, Iowa.	3
Iowa Farming Tool Co., Fort Madison, Iowa.	3
<b>AIR COMPRESSORS.</b>	
Clayton Steam Pump Works, 14 and 16 Water st., Brooklyn, N. Y.	50
McLaren John, Hoboken, N. J.	50
The Norwalk Iron Works Co., S. Norwalk, Conn.	48
<b>ALUMINUM.</b>	
Weinhold H., Philadelphia, Pa.	7
<b>ALUMINUM DRAWERS.</b>	
Fucker & Dorn, Indianapolis, Ind.	18
<b>ANTI-FRICTION METALS.</b>	
Philadelphia Smelting Co., Ltd., Philadelphia, Pa.	21
Field Bros. & Co., 35 Chambers, N. Y.	15
U. S. Smelting Works, Philadelphia, Pa.	16
<b>ASTORIA, MANUFACTURERS OF.</b>	
Cheney & Vail, Detroit, Mich.	37
Fisher & Norris, Trenton, N. J.	37
<b>ARMS AND AMMUNITION.</b>	
Alford, Ward & Co., 95 Chambers, N. Y.	39
Conway T. G., 30 Chambers, N. Y.	18
Eaton F. E., Chicago, Ill.	18
Field Alfred & Co., 35 Chambers, N. Y.	15
Harley & Graham, 17 Maiden Lane, N. Y.	12
Lovell John P. & Sons, Boston, Mass.	12
Remington & Co., 25 Broadway, N. Y.	12
Stevens J. & Co., Chicago, Pa.	12
<b>ASBESTOS MATERIALS.</b>	
The Chalmers-Spence Co., foot 9th St., E. R., N. Y.	38
<b>AXLES, SPRINGS, &amp; CO.</b>	
Cook R. & Sons, Winsted, Conn.	13
Lambertville, Pa.	13
Wurster F. W., Brooklyn, N. Y.	13
<b>BAG HOLDERS.</b>	
Spengler L. Jeff., Ashland, O.	10
<b>BANKERS.</b>	
Shipper John J., Cleveland, O.	6
<b>BARK WIRE.</b>	
Hawk For Steel Barb Fence Co., Burlington, Iowa	31
St. Louis Wire Fence Co., St. Louis, Mo.	16
Thorn Wire Hedge Co., Chicago, Ill.	6
<b>BARREL MACHINES.</b>	
Crosby H., Cleveland, O.	34
<b>BARREL TANK ATTACHMENTS.</b>	
Pancost & Mante, Philadelphia, Pa.	31
<b>BELLOWS, MANUFACTURERS OF.</b>	
Scott Geo. M., Chicago, Ill.	8
<b>BELLS (Sleigh).</b>	
Bevin, Wm. & Co., Easthampton, Conn.	25
<b>BELT HOOKS.</b>	
Browning, Sism & Co., 85 Chambers, N. Y.	25
<b>BELTING.</b>	
Alexander Bros., 412 N. 3d, Philadelphia	45
N. F. Beltine and Packing Co., 37 Park Row, N. Y.	14
Belt & Benli, Cleveland, O.	45
Whitely R. T., Chicago, Ill.	45
<b>BICYCLES.</b>	
<b>BIRD CAGES, MAKERS OF.</b>	
Gunter O., 46 Park Place, N. Y.	3
Jewett John C. & Sons, Buffalo, N. Y.	30
Lindeman O. & Co., 244 Pearl, N. Y.	3
Wachsmuth John, 12 and 22 Pearl, N. Y.	3
<b>BITS AND DRILLS, MANUFACTURERS OF.</b>	
Brown R. H. & Co., 125 West 14th St., N. Y.	31
Fray John S., Bridgeport, Conn.	31
Millers Falls Co., 74 Chambers, N. Y.	27
<b>BLACKS, TACKLE, MAKERS OF.</b>	
Bagnall & Lott, Boston, Mass.	27
McMillan Wm. H. & Co., 115 South, N. Y.	20
Pennell Block Co., Lockport, N. Y.	21
Providence Tool Co., Providence, R. I.	21
<b>ROLLER COVERINGS.</b>	
The Chalmers-Spence Co., foot 9th St., E. R., N. Y.	38
<b>ROLLER SAFETY BOLTS.</b>	
Duplex Safety Bolt Co., 31 Cortlandt, N. Y.	38
Harrison Roller Works, Philadelphia, Pa.	38
New England Mach'g Co., Liberty St., N. Y.	38
<b>ROLLER CUTTERS.</b>	
Howard Iron Works, Buffalo, N. Y.	44
Adams Wm. & Co., 125 West 14th St., N. Y.	44
Wiley & Russell, Greenfield, Mass.	44
<b>ROLLER DOGS.</b>	
Colles H. H. & Co., Philadelphia, Pa.	30
<b>ROLLER BELTS.</b>	
American Belt Co., Lowell, Mass.	46
Weiss & Lea, Philadelphia, Pa.	47
Green S. H., 12 Murray, N. Y.	47
<b>BRACKET WOODS.</b>	
Boyer J., 105 East 10th St., East River, N. Y.	40
<b>BRASS, MANUFACTURERS OF.</b>	
Ansonia Brass and Copper Co., 10 Cliff, N. Y.	28
Bridgeport Brass Co., Bridgeport, Conn.	28
Brown & Sons, 105 John, N. Y.	28
David John & Sons, 105 John, N. Y.	28
Detroit Copper and Brass Rolling Mills, Detroit, Mich.	28
Frey & Broomfield, York, Pa.	28
Holmes, Booth & Hayden, 45 Chambers, N. Y.	28
Merchant & Co., 125 West 14th St., N. Y.	28
Plume & Atwood, 401 N. 3d, N. Y.	28
Rome Iron Works, 412 N. 3d, N. Y.	28
Scott H. Co., 412 N. 3d, N. Y.	28
Waterbury Brass Co., 25 Broadway, N. Y.	28
<b>BRASS FOUNDRIES.</b>	
McFarland & Co., Trenton, N. J.	28
Reeves Paul A., Philadelphia, Pa.	28
<b>BRASS WIRE CLOTH.</b>	
Howard & Morse, 45 Fulton, N. Y.	2
<b>BRIDGE BUILDERS.</b>	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	4
<b>BUCKETS FOR CHAIN PUMPS.</b>	
Croby A. D., Cuba, N. Y.	43
<b>BUILDERS' HARDWARE.</b>	
Clark Mfg. Co., Buffalo, N. Y.	43
<b>BUTCHER AND MEAT KNIVES, MANUFACTURERS OF.</b>	
Wilson John, Sheffield, England.	43
<b>BUTTS AND HINGERS.</b>	
American Butt Co., 85 Chambers, N. Y.	15
New England Butt Co., Providence, R. I.	15
Sabin Mfg. Co., Montpelier, Vt.	15
Stanley Works, 125 West 14th St., N. Y.	15
Union Mfg. Co., 65 Chambers, N. Y.	15
<b>CAN OPENERS.</b>	
Schal & Henry, Baltimore, Md.	7
<b>CARRIAGE BELTS, MAKERS OF.</b>	
Hodges P. M., 125 West 14th St., N. Y.	41
Townsend, Wilson & Hubbard, Philadelphia, Pa.	47
<b>CARRIAGE HARDWARE, MAKERS OF.</b>	
Smith R. D. & Co., Philadelphia, Pa.	47
The E. D. Clark Co., Auburn, N. Y.	47
Wilcox & Howe, Hingham, Mass.	47
<b>CARRIAGE SPRINGS.</b>	
Dexter Spring Co., Hulton Pa.	26
<b>CAR AXLES.</b>	
Roberts A. P. & Co., 205 S. 4th, Philadelphia	5
<b>CATERPILLAR.</b>	
Phoenix Caterpillar Co., Indianapolis, Ind.	18
<b>CASTINGS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12
Woodhouse S., Newburg, Ohio.	12
<b>CHAINS, IRON.</b>	
Cheney S. & Co., Philadelphia, Pa.	6
Devlin Thos. & Co., Philadelphia, Pa.	6
Elwell Hardware Co., Bridgeport, Conn.	50
Haight & Clark, Albany, N. Y.	50
Hammer & Co., Branford, Conn.	50
Indiana Foundry Co., Indianapolis, Ind.	50
North Brook, Philadelphia, Pa.	50
Queen City Malleable Iron Co., Cincinnati, O.	50
<b>CASTINGS, STEEL.</b>	
Chester Steel Castings Co., 27 Liberty, Phila., Pa.	50
Furcia Steel Cast Co., Chester, Pa.	50
Flagg Stanley G. & Co., Philadelphia, Pa.	50
Pittsburgh Steel Co., Philadelphia, Pa.	50
<b>CHAIRMAN, MANUFACTURERS OF.</b>	
Bradley & Co., 10 Richmond St., Phila., Pa.	5
Cincinnati Rolling Mills, N. Y.	5
Stimall, O.	5
Miller Chain Co., Akron, O.	12



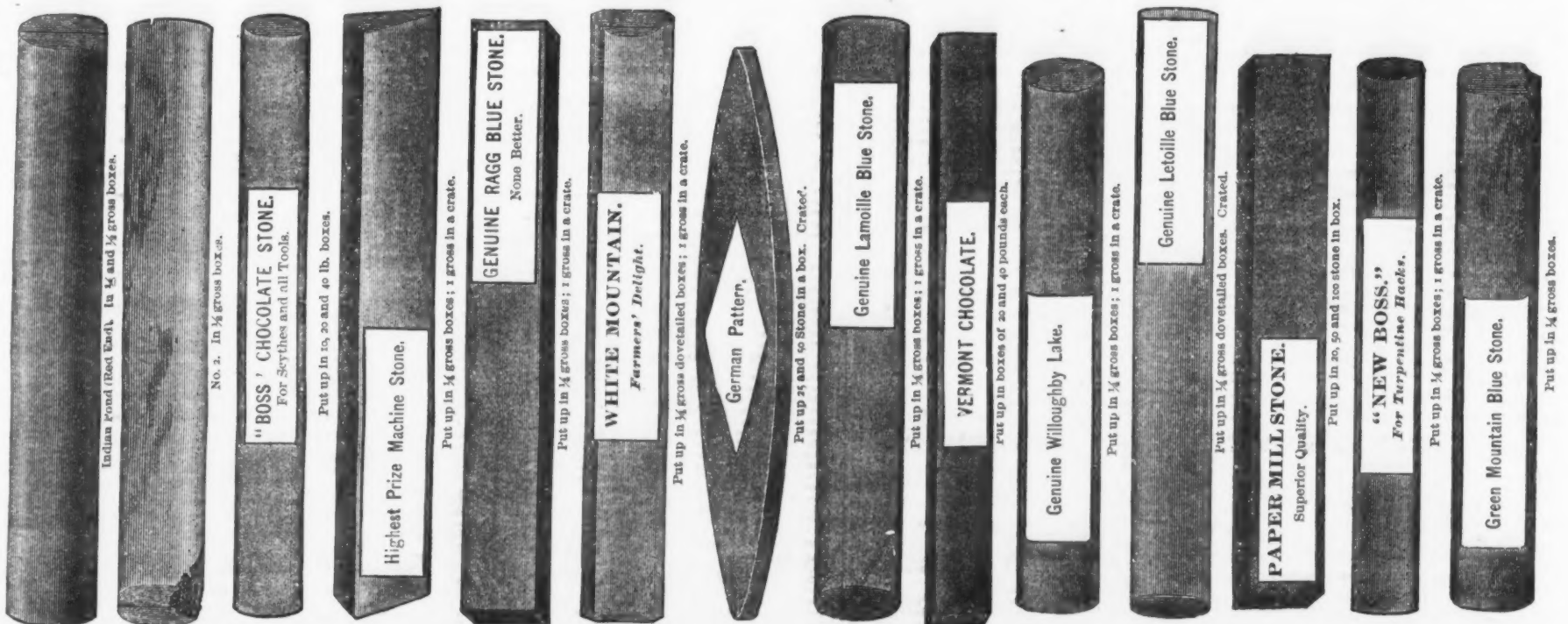


## LIST OF BRANDS.

Old,  
Reliable,  
Indian Pond,  
(Red End),  
Premium,  
Union,  
White Mountain,  
Letoile,  
Diamond Grit,  
Fisherman (Rough),  
Boss Hacker (Oval),  
Lamoille,  
Willoughby Lake,  
Green Mountain,  
Black Diamond,  
Ragg (9 and 10 inch),  
Mowing Machine,  
Paper Mill Stone,  
Vermont Darby,  
Chocolate,  
Axblitts,

WRITE ME FOR PRICES.

**A. F. PIKE, Pike Station, Crafton Co., N. H., U. S. A.**  
The World's Headquarters for Pike's Celebrated Blue Stone for Scythes and all Edge Tools.



# THE OHIO GRINDSTONE CO.

MANUFACTURERS OF

## GRINDSTONES

SUITABLE FOR ALL PURPOSES AND IN ANY QUANTITY.  
**Cleveland, Ohio.**

### The Iron-Masters' LABORATORY.

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestones, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia.  
With Branch at Warrenton, Virginia,  
**J. BLODGET BRITTON.**

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

## CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00  
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50  
For each additional constituent of usual occurrence..... 1.50  
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.  
For determining the per cent. of Sulphur or Phosphorus in Iron or Steel..... 7.00  
For each additional constituent of usual occurrence..... 6.00  
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone..... 10.00  
For each additional constituent..... 2.00  
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 15.50  
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.  
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.  
Printed instructions for obtaining proper average samples for analysis furnished upon application.



**GEORGE N. PIERCE,**  
BUFFALO, N. Y.,  
Manufacturer of

### BIRD CAGES AND REFRIGERATORS.

Send for Illustrated Catalogue.  
Prices quoted upon application to BUTLER & DIEL, Agents at Syracuse, N. Y.; OPEN STOVE VENTILATING CO., 28 Beekman St., New York; or GEO. N. PIERCE, sole manufacturer, Buffalo, N. Y.  
WHOLESALE AGENTS:  
L. SCHILLINGER, Syracuse, N. Y.  
PRATT & CO., Buffalo, N. Y.  
PRATT & CO., Elmira, N. Y.  
RATHBONE, SAUND & CO., Detroit, Mich.  
H. W. LENTZMEYER, Cleveland, Ohio.

### J. STEVENS & CO.,

Chicopee Falls, Mass. P. O. Box 224.

#### MANUFACTURERS OF SPRING CALIPERS AND DIVIDERS

Also, Surface Gauges and Counter Sinks, Stevens' Patent Breech-Loading Sporting Rifles, double and single-barrel; Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet Rifles. Our Shooting Gallery Rifle is the favorite everywhere.



W. W. CULBERTSON,  
President.

WM. NEHRING,  
Superintendent.

A. PLUEMER,  
Sec'y, Treas. and Gen'l Manager.

### QUEEN CITY MALLEABLE IRON CO.

Make all Shapes and Sizes of

### Malleable Iron Castings

known to the trade. Our specialty is

### WELDING MALLEABLE CASTINGS.

Guaranteed to weld perfectly and capable of being drawn under a hammer. Address,

N. W. Corner Vine and Second Streets,  
CINCINNATI.

### Wyoming Shovel Works,

WYOMING, LUZERNE COUNTY, PA.

Patent Plain Back Solid Shovels and Spades, Back Strap Shovels, Spades and Scoops.

RAILROAD AND MINERS' SHOVELS of Superior Quality a Specialty.  
Send for Price List, &c. **PAYNE PETTEBONE & SON.**

### CLARK'S



### IMPROVED SCREW DRIVER, And Case containing Handle and Set of SCREW DRIVERS.

The Blades are made of JESSOP'S CAST STEEL, with milled Points and Shanks, making them interchangeable, and are warranted.

This Driver has four Blades from 1/2 Inch to 1 Inch in width.

ALSO MANUFACTURER OF WILLIAM A. CLARK'S **Expansive Bit**, with two Cutters, boring from 7-8 to 3 inches.

### R. H. BROWN & CO.,

SUCCESSORS TO

WM. A. and F. E. CLARK,  
**WESTVILLE, Conn.**

### THE DEXTER CARRIAGE SPRING

Combines It is  
Strength, Graceful,  
Durability, Noiseless,  
Beauty, Light and Easy.

**DEXTER SPRING CO.,** Hulton, near Pittsburgh, Pa., U. S. A.

The DEXTER SPRING is the most perfect Carriage Spring ever invented. Wherever it is known it is rapidly superseding all others for pleasure vehicles. It is especially recommended for use on the rough roads of new countries, as its peculiar construction relieves the strain on the vehicle and shock to the passenger, while the high grade of material used reduces the probability of breakage to a minimum.

For circulars, prices, &c., address



## AKRON IRON COMPANY, AKRON, OHIO.

Sole Manufacturers of

### Patent Hot Polished Shafting.

Medal of Superiority awarded at American Institute Fair of 1880.

This Shafting is superior to any in the market, and commends itself to the trade for the following reasons, viz:

- 1st. It is perfectly straight and round.
- 2d. It can be finished accurately to any desired gauge.
- 3d. It will not rust or tarnish easily.
- 4th. It will not warp or spring in key seating.
- 5th. Its surface is composed of magnetic oxide of iron, and consequently presents a journal or bearing surface that is unexcelled.
- 6th. The peculiarity of its manufacture is such as to entail loss in making it, if other than superior stock is used. Those purchasing it may therefore be assured of receiving first-class material.

Price lists, catalogues and references furnished on application.

Where parties desire it we cut keyways or splines any length required, at a moderate charge.

**AKRON IRON CO., Akron, Ohio.**

## AGENTS:

E. P. BULLARD, 14 Dey Street, N. Y.  
S. E. BLISS, 89 Lake Street, Chicago, Ill.  
D. N. BROWN MACHINERY CO., St. Louis, Mo.  
J. H. KERRICK & CO., Indianapolis, Ind.  
JOSHUA HENDY, San Francisco, Cal.

## TRENTON LOCK & HARDWARE CO., TRENTON, N. J.

MANUFACTURERS OF

### DOOR LOCKS AND HARDWARE,

BRONZED IRON AND BRONZE METAL DOOR TRIMMINGS, BUTTS AND HARDWARE.

CAST BUTTS, DOOR BOLTS, WELL WHEELS, FLUSH BOLTS, SHUTTER BOLTS, PAD LOCKS, BARN DOOR HANGERS, & RAIL, CRINDSTONE FIXTURES, SCREW & SIDE PULLEYS, NOISELESS PULLEYS, HAY FORK PULLEYS, SHELF BRACKETS,

PHILADELPHIA SLIDING DOOR HANGERS AND RAIL.

Having largely increased our facilities and line of goods, we invite the attention of the Trade.

Illustrated Catalogues Furnished on Application.

Agencies: James M. Vance & Co., No. 211 Market St., Philadelphia.  
James Marshall, No. 48 Warren St., New York.

## THE STANLEY WORKS,

MANUFACTURERS OF

### Wrought Iron Butts, Hinges

AND

### DOOR BOLTS,

Plain, Japanned, Bronzed and Plated.

FACTORIES:

WAREHOUSE:

New Britain, Connecticut.

79 Chambers St., New York.

### Wilson Bohannon,

Manufacturer of Patent

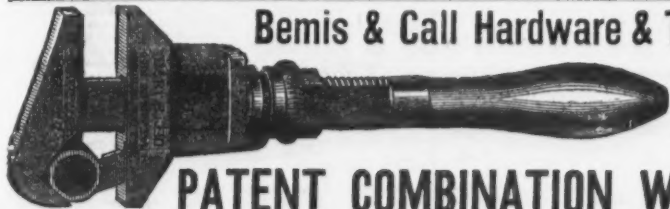
### BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.

Patent Horizontal Rim Cylinder Night Latch. Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob. RIGHT OR LEFT HAND.

PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned. 12" Catalogues and Samples sent on application. BROOKLYN, N. Y.

### Bemis & Call Hardware & Tool Co.



### PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

### The Farrel Foundry and Machine Co.

ANSONIA, CONN.,

Manufacture Improved

### ROCK & ORE BREAKERS,

(THE "BLAKE" STYLE),

designed for breaking to small pieces and one-third dust all kinds of hard and brittle substances, such as Quartz, Emery, Gold and Silver Ores, Coal, Plaster, Iron, Copper and Lead Ores, also, Stone for making Concrete and Railroad Ballast.

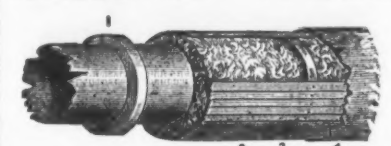
Twenty years of practical test, at Home and Abroad, has proven this machine to be the best one ever invented for the purpose. Mr. S. J. Blake, for the past fifteen years connected with the manufacture of these machines, has charge of this department of our works, and will personally superintend their erection within a reasonable time. Chilled Rolls and Rolling Mill Machinery, Power Presses, single and double acting; also, Hammers, Drops and Lifters; Shaking; Pulleys and Hangers.

COPELAND & BACON, General Agents, 55 Liberty St., New York.

### GUN POWDER. Lafin & Rand Powder Co.

No. 29 Murray Street, New York,  
Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as  
**ORANGE LIGHTNING,**  
**ORANGE DUCKING,**  
**ORANGE RIFLE**  
more popular than any Powder now in use.  
**Dusting Powder and Electrical Blasting Apparatus.**  
**Military Powder** on hand and made to order.  
**SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.**  
Pamphlets showing sizes of grain sent free.

### Mineral Wool.



A fibrous material, encasing about 90 per cent. of its volume of air, and therefore a superior

### NON-CONDUCTOR

OF

### HEAT AND SOUND.

Being made from the slag of blast furnaces, it is fire-proof and durable in contact with heated surfaces. Readily applied.  
Heaviest grade about 25 lbs. per cubic foot. Price, 1 cent per lb. at works.

### U. S. MINERAL WOOL CO.,

16 Cortlandt St., New York.

### KEYSTONE RIVETING FORGE.



An Improved Pattern.

Cheap and Durable.

BEST IN THE MARKET.

Send for catalogue to

KEYSTONE PORTABLE FORGE CO.,  
204 North 4th St., Philadelphia, Pa.



John Waldron,

Manufacturer of

Sprout's Double and Single Shear

Horse Hay Forks

And

Sprout's

HAY ELEVATORS,

PULLEYS and

GRAPPLES.

Send for Circulars.

Macey, Lycoming Co., Pa.



THE SAFETY

Combines every advantage possible in an

ICE CREEPER.

Attaches with a thumb

screw; turns over into

ladder; one size for all.

R. P. SCOTT & CO.,

Manufs., NEWARK, N. J.

### FOR SALE,

At New England Machinery Depot,  
308 North Third St., Philadelphia, Pa.  
Horizontal, Vertical and Locomotive Tubular Boiler, from 3 to 6 H. P., in stock and larger to order. Engines all sizes. Pumps, Heaters, Injectors, steam and hand Brick and Mortar Hoists. Boiler Test Pumps. The new Gravity Coffee Roaster. All of the above constantly kept in stock. Send for circular and price list.



ZERO

REFRIGERATOR.

with Water, Wine and

Milk Cooler. Best Food

and Ice Preserver in

the world. Send for

Book. A. M. LESLEY,

380 Sixth Avenue.

Also the Rotunda Fur

nace.



GIES & CO.

LITHOGRAPHERS

AND

PRINTERS

BUFFALO, N. Y.

POSTERS, SHOW CARDS & CIRCULARS

TRAVELLERS' & CATALOGUES

SPECIALTY.

BLANK BOOKS MADE TO ORDER.

WOOD ENGRAVING AND ELECTROTYPING

### STOVE REPAIRS.

Repairs for Stoves made at Troy, Albany, Rochester, Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago, Milwaukee and elsewhere, at  
W. C. METZNER,  
227 W. Randolph St., Chicago, Ill.

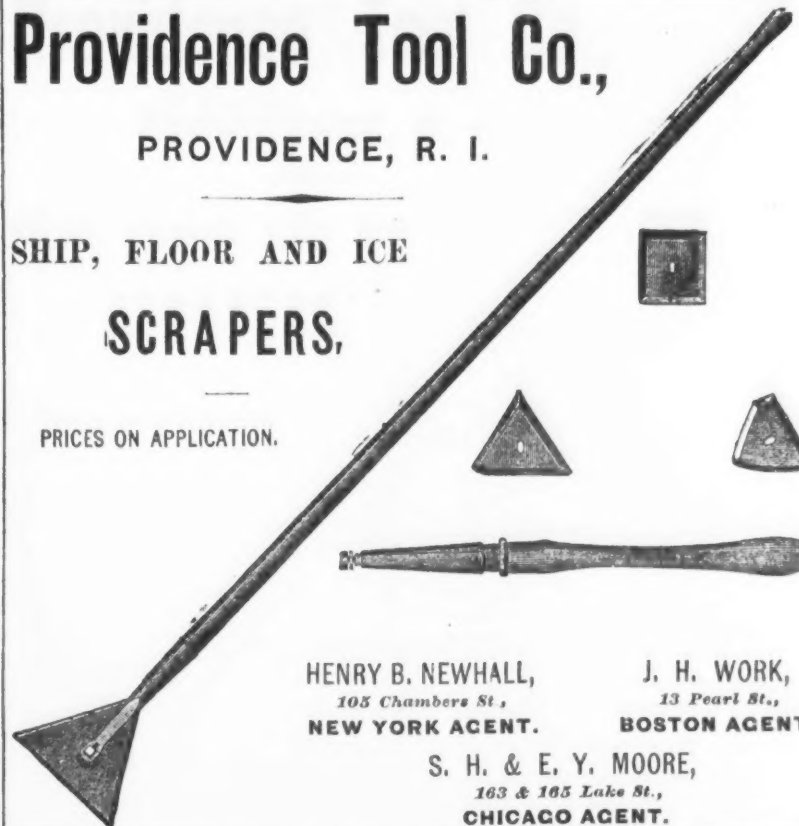
## Providence Tool Co.,

PROVIDENCE, R. I.

SHIP, FLOOR AND ICE

### SCRAPERS.

PRICES ON APPLICATION.



HENRY B. NEWHALL,  
105 Chambers St.,  
NEW YORK AGENT.

J. H. WORK,  
13 Pearl St.,  
BOSTON AGENT

S. H. & E. Y. MOORE,  
163 & 165 Lake St.,  
CHICAGO AGENT.

### THE GENUINE STEBBINS

### MOLASSES & OIL GATES,

MANUFACTURED ONLY BY

### E. STEBBINS MFG. CO.

BRASS FOUNDERS AND FINISHERS.

Sole Manufacturers

Stebbins and Bright-  
wood

### COMPRESSION

AND

### GROUND KEY WORK.

Send for circular and price

list

H. M. BREWSTER, Agent,

Brightwood P. O., Mass.

### Terry's WROUGHT Iron

### BARN DOOR HANGER & RAIL



The BEST  
Hanger and Rail  
in the market.  
Will not break;  
cannot get off the  
track.  
As cheap as the  
best cast iron.

Snow and Ice  
cannot lodge on  
the Rail.

Write for Circulars.

### TERRY MFG. CO., Dundee, N. Y.

ATTENTION.—Three tools combined. AN ANVIL, the face of which is chilled, hardened and polished. A PARALLEL VISE, with four-inch steel face jaws, which open six inches. AN ADJUSTABLE VISE that will hold wedge shaped articles.

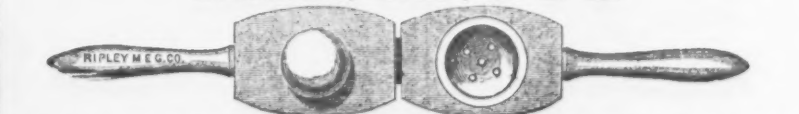


For discounts address

CHENEY ANVIL & VISE CO., - - Detroit, Mich.

### RIPLEY MANUFACTURING CO.,

Unionville, Conn., U. S. A.



### BEST PORCELAIN-LINED LEMON SQUEEZERS

"COMMON SENSE" MOUSE TRAPS.

HAND-MADE ROSEWOOD FAUCETS, &c., &c.

### SABIN MFG. CO.,

MONTPELIER, VT., MANUFACTURERS OF

### DOUBLE-ACTING SPRING BUTTS,

SABIN'S LEVER DOOR SPRINGS, For heavy doors,

BOSS AND CROWN SPRINGS, For light doors,

Send for Catalogue. Represented in New York by DAVID HYNES & CO., 22 Church St.



### RIVETS

C. F. HARRISON,  
BOILER, BRIDGE & TANK

### RIVETS

CUYAHOGA FALLS, OHIO.







[illegible]





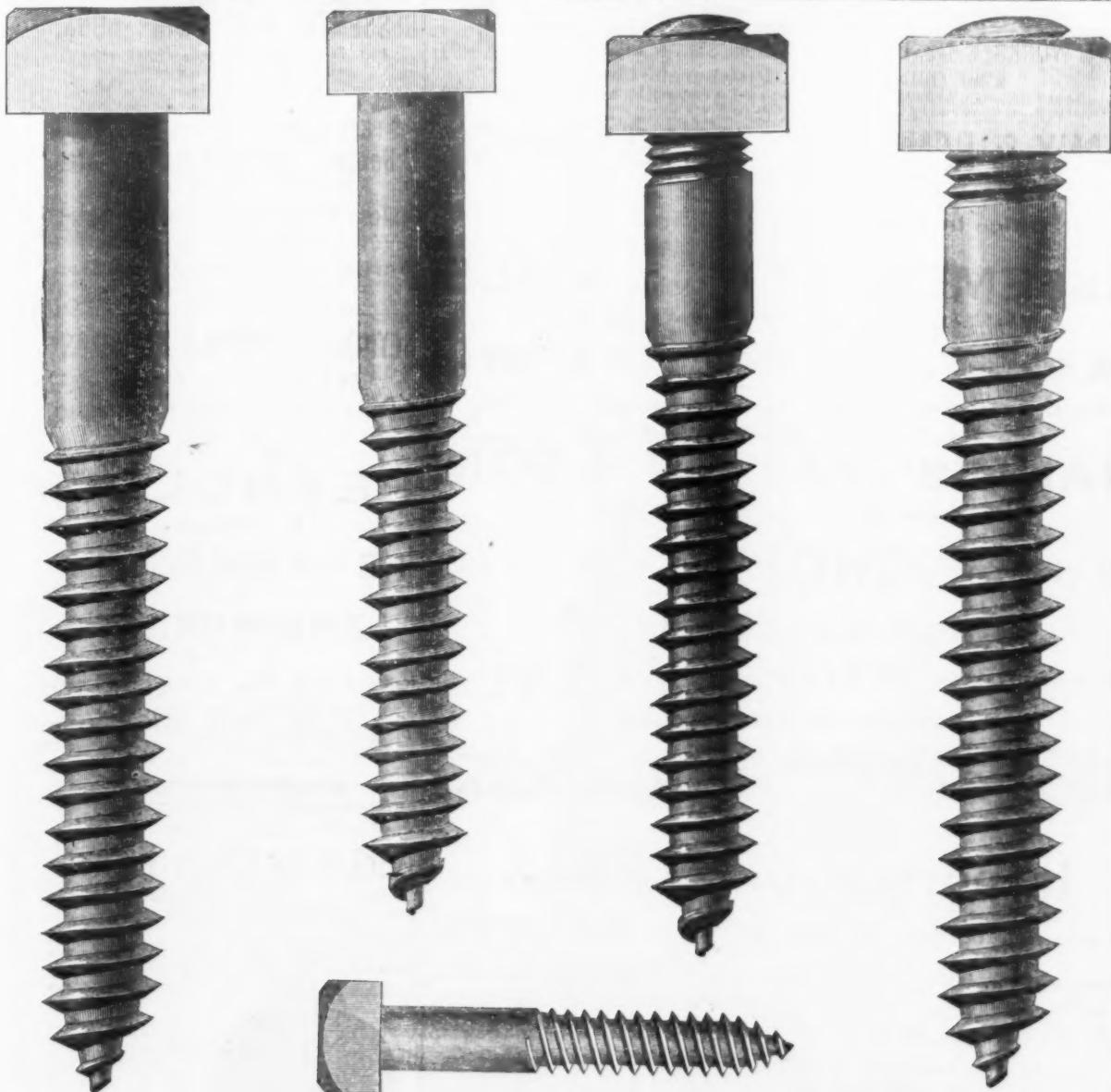


# BELLAIRE NAIL WORKS, PIG IRON AND NAILS,

Manufacture the Celebrated Brand of

## BELLAIRE NAILS

Office and Works, - - BELLAIRE, OHIO.



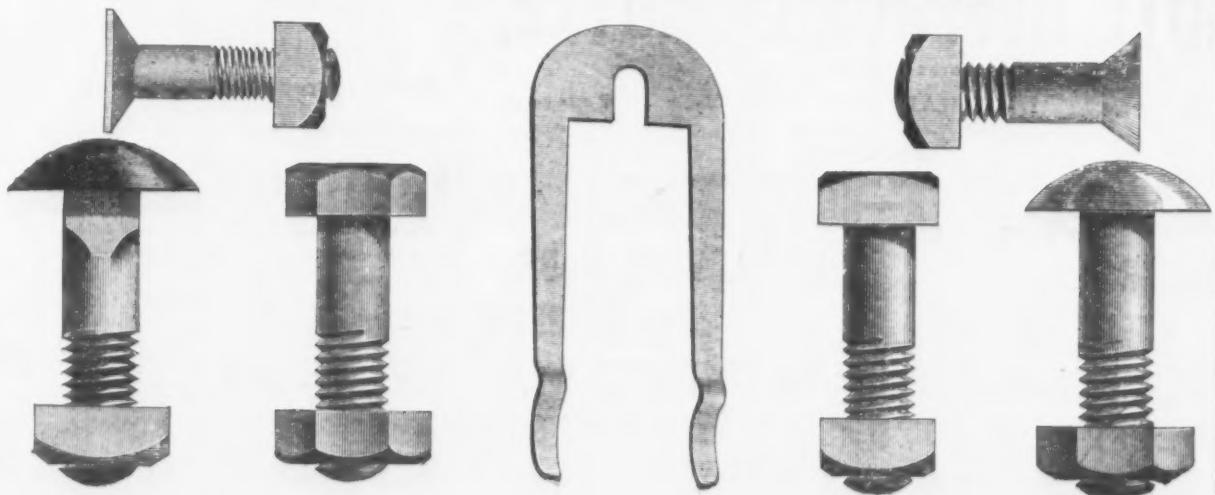
WILLIAM H. HASKELL & CO.,  
MANUFACTURERS OF

### BOLTS & COACH SCREWS

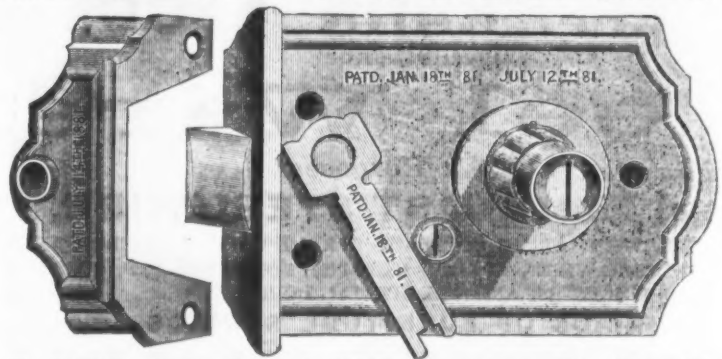
277 Main St., Pawtucket, R. I.

SEND FOR CATALOGUE.

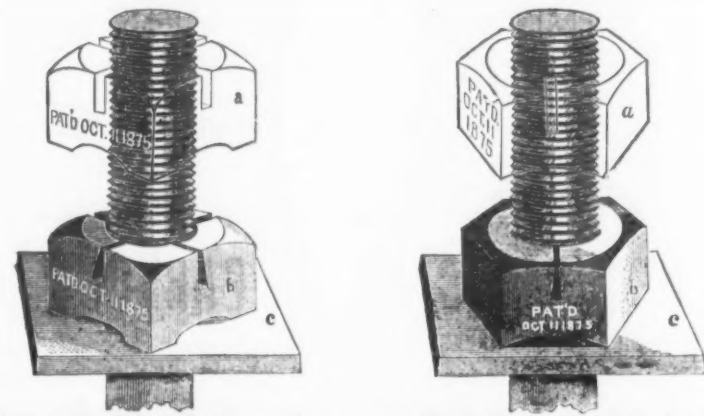
HENRY B. NEWHALL, 105 Chambers St., New York Agent.



### BARNES' NEW RIM NIGHT LATCH.



H. F. SISE, Sole Agent, 100 Chambers St., New York.



a. Atwood Nut on bolt without bearing on base—slot open.  
b. Atwood Nut turned to bearing on base, partially closing the slot, and grasping the bolt.

a. Atwood Nut on bolt without bearing on base—slot open.  
b. Atwood Nut turned to bearing on base, partially closing the slot, and grasping the bolt.

SPRINGFIELD, MASS., JULY 1, 1881.

DEAR SIR: The past four years have demonstrated the practical value of the "Atwood Safety Nut." It was patented from Springfield, Mass., and first put to work in its own town by practical and conservative mechanics and engineers. Safety Nuts put on the Boston and Albany Railroad cars, in the year 1877, have never had occasion to be tightened; neither have the bolts ever been loose in their work. Safety Nuts put on the track of the Boston and Albany Railroad have exceeded the trackmen's expectations. Every mechanic will comprehend at a glance, that its workings are in harmony with all accepted mechanical laws and principles; i. e., the nut, instead of bearing in a straight line on the bolt as the common one does, is, when turned home, forced towards the center of the bolt; and any strain on the bolt, after the nut is home, tends to act like the wrench turning it on. As the bearing corners of the nut being the highest—the top must incline towards the center of the bolt, clamping the bolt tightly. And the more strain on the bearing corners, the more resistance at the top. The nut will stand a harder turning from the wrench, without breaking the bolt, as it is elastic, while the common nut, being rigid, when it is brought to a bearing the thread must be overstrained in order to cause friction enough to stay in its place when first put on; and then, if any strain is put on it in the opposite direction, or between nut and head of bolt, the apexes of the thread are drawn over, leaving the nut loose on the bolt; or, if a Jam nut is used, the nuts will be found as when put on, but the bolt loose in its work. Remember, the "Atwood Safety Nut" never loosens, neither will the bolt loose in its work.

The Safety Nut is invaluable to every Railroad Company. Only one Nut is used. Its cost is less than the Jam Nut. The bolt is not required to be as long as when the Jam Nut is used. Time is saved in turning on and off; the bolt is always perfect and no loss of Nuts by jarring off along the road—thus saving money to those who use them.

The Boston and Albany Railroad were the first to use the Safety Nut, and are now putting it on to their ENGINES, CARS AND TRUCKS.

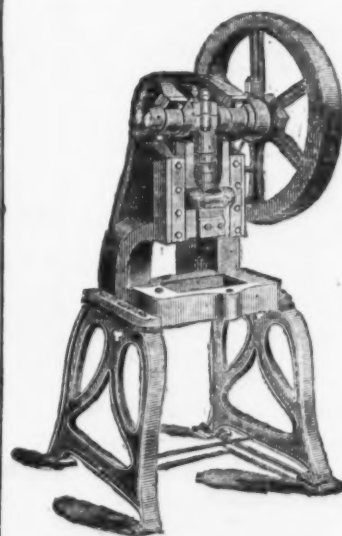
We would respectfully refer you to the New York Central and Hudson River Railroad Co., New York. Also, Boston and Albany Railroad Co.; Wilson Eddy master mechanic; F. D. Adams, Supt. car department; W. H. Russell, chief engineer and road master; G. R. Hardy, ass't engineer. Other large railroads are now using the Safety Nut, to whom we will refer if desired.

We would like to have you try the Nut, and we are certain you will use it afterwards altogether.

Very respectfully yours, ATWOOD-SAFETY NUT CO.

J. W. LABAREE, Sec. and Treas.

OFFICE ROOM 2, AGAWAM BANK BUILDING, Opposite Massachusetts House, SPRINGFIELD, MASS.



### G. A. CROSBY & CO.,

259 &amp; 261 Randolph St.,

CHICAGO, ILL.,

Manufacturers of all kinds of

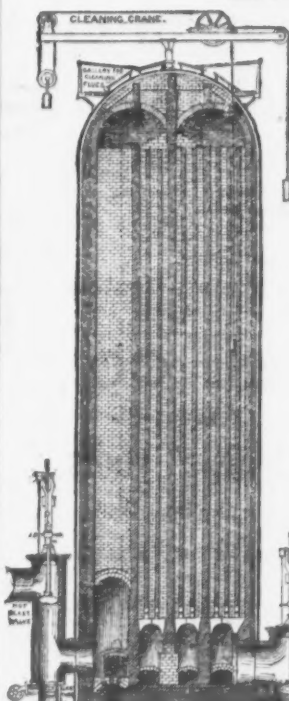
### Power, Screw, Hand, Foot and Drop

## PRESSES, DIES,

And Special Tools for Tin Can Makers and  
Sheet Metal Workers.

Send for Catalogue and Price List.

## WITHEROW & GORDON, ENGINEERS.

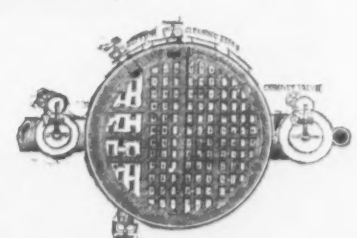


### Whitwell Fire-Brick

## HOT-BLAST STOVES

Contract for erecting the same. Also, for Building and Replacing all types of Blast Furnaces. Combining Economy with Efficiency and Modern Improvements, wherein the output of Furnaces is increased fully 50 per cent. and the fuel consumption decreased in the same ratio.

Our Blast Engines, Hoisting Engines, &c., have no superior in strength of parts, duty or economy. We solicit an opportunity to make proposals on Blast Furnaces, Rolling Mill or Steel Works Machinery.



Main Office, 86 Water St., Pittsburgh, Pa.

WORKS, NEW CASTLE, PA.



Steel.

**WOLFF, KAHN & CO.,**

MANUFACTURERS OF

**Steel Wire**

For All Purposes.

**Special Finest CAST STEEL WIRE,**

MARKET STEEL WIRE, PRIME COPPERED SPRING WIRE, TEMPERED AND UNTEMPERED STEEL WIRES, IN LONG LENGTHS, FOR CRINOLINE, CORSET, LOCK AND BRUSH MAKERS, AND ALL SPECIAL PURPOSES.

**ALL KINDS OF FURNITURE SPRINGS.**

IMPORTERS OF

**IRON STEEL, & RAILS**

OF EVERY DESCRIPTION.

WIRE RODS, PLAIN AND GALVANIZED WIRES, &amp;c.,

GUN BARRELS, MOULDS, AND ORDNANCE.

Shipments in bond from American Ports and direct from Europe to all parts of the World.

**EXPORTERS AND GENERAL MERCHANTS.****WORKS, PEEKSKILL, N. Y.**

Direct all communications of the

**OFFICE & WAREHOUSE, 93 John St., New York.****MILLER, METCALF & PARKIN,****Pittsburgh, Pa.,**

Manufacturers of

**CRESCENT STEEL,**

In Bars, Sheets, Cold-Rolled Strips, &amp;c.

Polished, Compressed Drill Rods and Wire.

Warranted equal to any imported in quality, finish and accuracy.

Also Common Grades.

Established 1810.

**J. & RILEY CARR,****SHEFFIELD, ENGLAND.**

Manufacturers of the "Celebrated

**DOG BRAND" FILES.**

Also of Superior

**STEEL**

For Drills, Cold Chisels, Tools, Taps, Dies, &amp;c.

**COLD ROLLED STEEL for Clock Springs, Corsets, &c.****SHEET CAST STEEL for Springs, Saws, Welding and Stamping Cold, &c.****GERMAN, MACHINERY, ENGLISH AND SWEDISH SPRING STEEL,**

And all other descriptions for machinists and agricultural purposes.

**Warehouse, 30 Gold Street, New York.**

Near John Street.

**HENRY MOORE, Agent.****S. & C. WARDLOW,****Sheffield, England,**

Manufacturers of the Celebrated

**Cast and Double Shear****STEEL.**

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

**Warehouse, 95 John Street, New York.****WILLIAM BROWN, Representative.****Cleveland Rolling Mill Co.,**

Manufacturers of

**BESSEMER STEEL**

AND

**Iron Rail and Fastenings,****SPRING STEEL**

AND

**WIRE OF ALL KINDS,****Tire, Axles and other Forgings,**

Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and Siding of Siemens-Martin, Bessemer Steel and Iron.

**CLEVELAND, OHIO.**

Western Agency,

**91 Lake Street, Chicago.****N. D. PRATT, Agent.**

New England Agency,

**239 Franklin Street, Boston.****JOHN WALES & CO., Agents.****THE MIDVALE STEEL CO.,****NICETOWN, PHILADELPHIA.****Best Warranted Cast Steel for Machinists' Tools,**

Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,

**Extra Mild Center Steel, special for Taps,**

ALSO,

**MACHINERY AND CAST SPRING STEEL, HEAVY AND LIGHT FORGINGS.****Warehouse, No. 12 North 5th St., Philadelphia.**

Address A. M. F. Watson, General Sales Agent.

**STEEL****Gautier Steel.**

See Page 3.

Steel.

**NEWARK STEEL WORKS.****BENJAMIN ATHA & CO.,**

Manufacturers

**BEST REFINED CAST STEEL**

And grades of Steel specially adapted for Lathe Tools, Chisels and Taps and Dies.

**Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.**

A full assortment of this universally approved OLD BRAND and other Steels for sale by

**EDWARD FRITH & SON, Agents,****No. 241 Pearl St., New York.****LABELLE STEEL WORKS.****SMITH, SUTTON & CO.,**

MANUFACTURERS OF ALL KINDS OF

**STEEL.****Also Springs, Axles, Rake Teeth, &c.****OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny,****Post Office Address, Pittsburgh, Pa.**

Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND &amp; CO., 624 and 626 Market St.; at Cleveland by CONDI, WICK &amp; CO., 153 Water St.

**ALBANY & RENSSLAER IRON & STEEL CO.,****Troy, N. Y.,****Office in New York City, 56 Broadway,**

MANUFACTURERS OF

**BESSEMER STEEL RAILS,****Machinery Steel, Merchant and Ship Iron.****HORSE SHOES.****SAM'L G. B. COOK & CO., Agents for Southern States,****67 and 69 German Street, Baltimore, Md.****FRANCIS HOBSON & SON****97 John Street, NEW YORK.****Sole Manufact'rs of "CHOICE" Extra Cast Steel.****Manufacturers of all Descriptions of Steel.****Manufacturers of Every Kind of Steel Wire.****Don Works, Sheffield, England.****CHAS. HUGILL, Agent.****GEO. SANDERSON & CO.,**

MANUFACTURERS AND

**Importers of STEEL,****Removed to 30 Gold Street, New York.**

Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS, TABLE AND POCKET CUTLERY, TOOLS, TAPS AND DIES; also for COLD ROLLED STEEL for CLOCK SPRINGS, CORSET CLASPS, &amp;c.

**A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.****Warranted Superior to any Steel in the Market, either English or American, for every purpose.**

Also,

**Combination Chrome Steel and Iron for Safes, Jails and Deposit Vaults.**

Send for Circular and Price List.

**CHROME CAST STEEL.****Home Steel Works,****Kent Avenue and Keap Street,****BROOKLYN, E. D., N. Y.****Chicago Branch,****40 Dearborn Street,****Cincinnati Branch,****123 Central Avenue,****JOLIET STEEL COMPANY,**

MANUFACTURERS OF

**Steel Rails,****ALL WEIGHTS.****The Company warrant its Rails equal in quality to any manufactured in the United States.****ALEX. J. LEITH, President,****W. R. STIRLING, Treasurer,****C. E. SARGENT, Secretary,****Office, Rooms D and E, Honore Building.****CHICAGO.****H. S. SMITH, General Sup't,****JOLIET.****Works, Joliet, Ill.****GUTE HOFFNUNG'S HUTTE,****(Works of Good Hope.)**

Established 1781.

**OBERHAUSEN, ON RUHR.**

8500 men employed.

BRAND:

**G. H. H.****STEEL RAILS,****STEEL WIRE RODS,****STEEL BLOOMS,****SPIEGELEISEN,****FERROMANGANESE UP TO 80 PER CENT.****GODEFFROY & CO., Sole Agents for the United States,****43 New Street, NEW YORK.**

Steel.

**R. MUSHET'S****Special Steel**

FOR

**LATHES, PLANERS, &c.**

Turns out at least double work by increased speed and feed, and cuts harder metals than any other Steel. Neither hardening nor tempering required.

Sole Makers,

**SAMUEL OSBORN & CO.,****Sheffield, England.**

Represented in the United States by

**B. M. JONES & CO.,****Nos. 11 & 13 Oliver Street, BOSTON.****NAYLOR & CO.,**

99 John St., New York.

6 Oliver St., Boston, Mass.

**W. R. HART, Agent,****208 S. Fourth St., Philadelphia, Pa.**

IMPORTERS OF

**STEEL AND IRON RAILS,****Tin and Terne Plates,****Swedish and Norway Iron,****BESSEMER STEEL WIRE RODS,****Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.**

MANUFACTURERS OF

**STEEL COMPRESSED SHAFTING,****"Benzon" Homogeneous Plates****For Boilers, Fire-boxes, &c.****Axles, Crank Pins, Spring Steel,****And all other kinds of****Martin-Siemens Steel and Iron****For Railroad purposes.****REYNOLDS, CARTER & REYNOLDS****3 Clements Lane,****Lombard Street, LONDON, E. C.**

Cable Address:

**REYNOLDS,****London,****Iron and Steel Merchants**

AND

**ENGINEERS.**

Exporters of

**Iron and Steel Rails, Blooms, Spiegeleisen,****Pig Iron, Old Rails, Scrap Iron, Iron Ore,****and all kinds of Railway Plants,****Engines and Piping for Water-****works, Mining Machinery, &c.****The Most Durable and Best Selling****Bucket for Chain Pumps.**

It has no valves to become obstructed and no screw joints to become immovable by rust.

Advantages of the Crosby Bucket over all others:—1. It has an air chamber on top, which conducts the air to the bottom of the well. 2. It is self-expanding, the base of the bucket being 1/4 of an inch larger at the bottom than bore in the tubes, which allows it to expand and the groove in the side to contract. 3. The wear comes on the whole side, and not on the extreme edge like other buckets. 4. It contains more solid rubber than three of any other manufacture. Three sizes—1/4 inch for deep wells, 1/2 inch for 45 feet or less, 2 inch for stock pumps. No charge for Territorial Rights. NONE GENUINE unless A. D. Crosby appears in raised letters on base of each Bucket.

Send for Price List. Agents wanted in every county. Address A. D. Crosby, Patentee and General Agent, Cuba, Allegany county, N. Y. For Sale by W. &amp; B. Douglas, 25 and 27 John St., N. Y., and all General Hardware and Pump Dealers.

**EMPIRE STATE MFG. CO.****BUFFALO, N. Y.**

Copper,

Half Copper,

Nickel Plated

**TEA KETTLES.**

Metal Spinning.

A. PARDEE, Hazleton, Pa.

J. G. FELL, Phila.

**A. PARDEE & CO.****237 South Third St.,****PHILADELPHIA,****No. 111 Broadway, New York.****MINERS AND SHIPPERS OF****Lehigh Coals.**

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.

**A. Pardee & Co. } HAZLETON, CRANBURY, SUGAR LOAF.****Pardee, Bro. & Co. } LATTIMER.****Calvin Pardee & Co. } HOLLYWOOD****Pardee, Sons & Co. } MT. PLEASANT.**



## Steel.

## CARNEGIE BROS. &amp; CO., LIMITED,

THOS. M. CARNEGIE,  
Chairman.

PITTSBURGH, PA.

D. A. STEWART,  
Treasurer.

## EDGAR THOMSON STEEL WORKS DEPARTMENT.

Works at Bessemer Station, P. R. R.

Branch Office and P. O. Address, 48 Fifth Ave.,

MANUFACTURERS OF

## STEEL RAILS, BLOOMS &amp; INGOTS

OF SUPERIOR QUALITY.

## Union Iron Mills Department

Mills at Thirty-third St. and A. V. R. R.

Branch Office and P. O. Address, Thirty-third St.

MANUFACTURERS OF

## STRUCTURAL IRON.

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees,  
Universal Mill Plates, Bar Iron, Light Steel and Iron Rails.

Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished  
to Engineers and Architects on application.

NEW YORK OFFICE: Room 32, No. 55 Broadway, N. Y.

## NORTH CHICAGO ROLLING MILL CO.

ESTABLISHED 1857.

CAPITAL, \$3,000,000.

INCORPORATED 1869.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

MERCHANT BAR, FISH PLATES, PIG METAL,  
IRON RAILS & BESSEMER STEEL RAILS.

Present Annual Capacity of these Works.	Fish Plates.....13,000 tons
	Merchant Bar.....10,000 "
	Pig Metal.....10,000 "
	Iron Rails.....10,000 "
	Steel Rails.....10,000 "
	Total Capacity per year.....43,000 "

## OFFICES.

17 Metropolitan Block, Chicago, Ill.  
37 Mitchell Block, Milwaukee, Wis.O. W. POTTER, President, CHICAGO.  
N. THAYER, Jr., Vice President, Boston.  
S. CLEMENT, Treasurer, MILWAUKEE.  
R. C. HANNAH, Secretary, CHICAGO.

## THE MONTOUR IRON &amp; STEEL COMPANY.

WORKS AT DANVILLE, PA.

## PIG IRON, T AND STREET RAILS,

A general assortment of mine and narrow gauge rails kept on hand, from which shipments can be  
made promptly.  
W. E. C. COXE, President, Reading, Pa. F. P. HOWE, Gen'l Supt., Danville, Pa. S. W. INGERSOLL, Treasurer,  
227 South Fourth St., Philadelphia, Pa.

## THE SIEMENS-ANDERSON STEEL CO.,

Successors to ANDERSON & CO.,  
Manufacturers ofCrucible Tool, Cast Spring, Cast Plow, Iron Centre,  
Soft Centre, and Iron Back Plow, also Open Hearth  
Spring, Tire, Plow, Machinery, and

## ALL DESCRIPTIONS OF STEEL.

And Sole Proprietors of the Siemens Direct Process in the United States.

President, THOS. T. FLAGLER, of the Holly Manufacturing Co., Lockport, N. Y. Treasurer, L. M.  
LAWSON, of Donnell, Lawson & Simpson, New York. Asst. Treasurer, S. A. COSGRAVE, Pittsburgh,  
Pa. Secretary, C. G. HILDRETH, New York. Vice President and General Manager, ROBT. J. ANDER  
SON, Pittsburgh. Attorneys, Messrs. ARTHUR, KNEVALS & RANSOM, New York.

HUGH McNEILL, Chairman.

JNO. C. PORTER, Sec'y and Treas.

## THE SPANG STEEL AND IRON CO., Limited,

MANUFACTURERS OF

## OPEN HEARTH STEEL,

BLOOMS, BILLETS, FLAT BAR, ROUNDS, AND  
ANGLES, SQUARES,

Steel for Agricultural and other Purposes.

## UNIVERSAL MILL PLATES

Of Steel and Iron, up to 30 inches wide, and of any desired thickness and length.

Address,

PITTSBURGH, PA.

## THE CLEVELAND

## CRUCIBLE

STEEL CO.

Manufacturers of

TOOL,  
MACHINERY,  
SPRING,  
TIRE,Warranted equal to  
any made.S  
T  
E  
CLEVELAND,  
L OHIO.

## E. C. ATKINS &amp; CO.

SPECIALTY:  
LARGE CIRCULAR SAWS.SOLE MANUFACTURERS  
OF THE GENUINE  
SILVER STEEL DIAMOND X CUT SAW

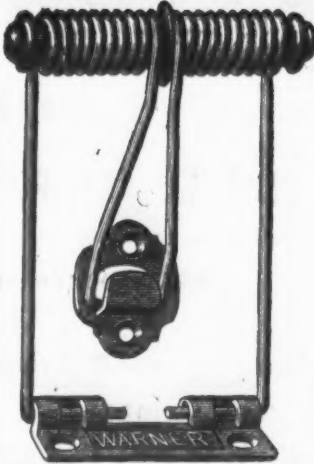
## INDIANAPOLIS, IND.

## DIAMOND BRASS WORKS, York, Pa.

FREY &amp; BROOMELL, Manufacturers of

HEAVY AND LIGHT BRASS CASTINGS. CAR BRASSES AND RABBIT METAL A SPECIALTY.  
Send for Prices. HIGHEST PRICE PAID FOR OLD METALS.

## THE "WARNER" DOOR SPRINGS

are the most simple, most effective and most convenient ever introduced, and the immense sale we  
are having shows their great popularity and superiority.There never was a Spring made that is so durable, so complete in its action, operating with a  
uniform pressure, holding the door tight when closed, and allowing it to open without increasing  
the pressure at any point.

When the door is opened about 130 degrees of a circle, it will press and hold it open.

The Spring is easily unhooked and rehooked—in an instant—from the door and also  
from the jamb, without removing a screw or pin.

This is a Convenience Possessed by no other Spring in the Market.

We are making this season three sizes, viz:

No. 1 For Screen or Light Storm Doors.

No. 2 For Medium Doors.

No. 3 For Heavy Doors.

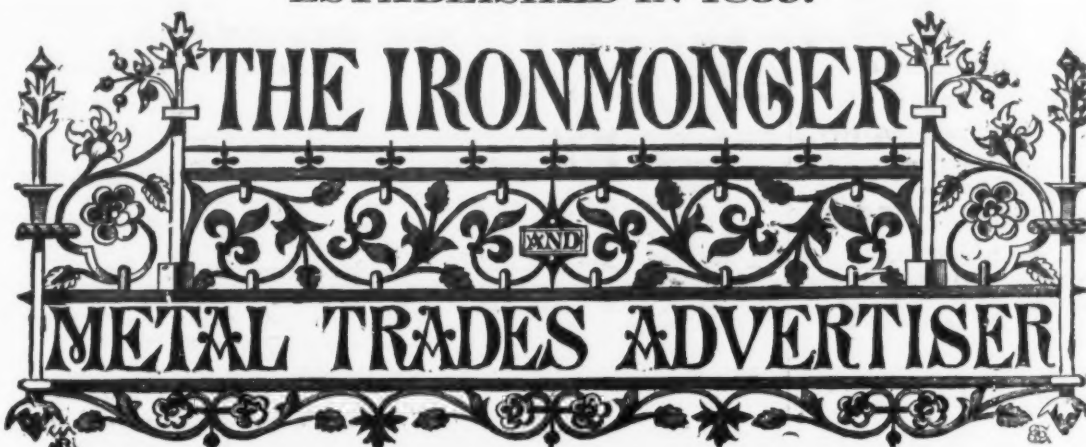
They are for sale by most of the prominent jobbers of the United States and Canada.

Correspondence solicited.

## FREDERIC BARTLETT,

FREEPORT, ILLINOIS.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

NEW YORK OFFICE: DAVID WILLIAMS, Publisher of The Iron Age, 83 Reade street, who will, on receipt of application, supply  
specimen copies free.PITTSBURGH OFFICE: 77 Fourth Avenue—JOS. D. WEEKS,  
Manager and Associate Editor.PHILADELPHIA OFFICE: 220 South Fourth Street—THOMAS  
HOBSON, Manager.CINCINNATI OFFICE: Builders' Exchange—T. T. MOORE,  
Manager.SOUTHERN OFFICE: Cor. Eighth and Market Streets, Chatta-  
nooga, Tenn.—S. B. LOWE, Manager.

## SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to  
week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.  
Special Correspondents.—The Ironmonger has a deserved reputation for its special correspondence from all the principal Continental, British  
and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities  
for acquiring information specially suited for the columns of the Ironmonger. The Week, Legal News, Trade Notes, Bankruptcies, Foreign  
Notes, Colonial Settings, Merchants' Circulars, &c., are each departments of the journal, containing a digest of all matters of direct interest  
to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French,  
Belgian and other Special Correspondence.

## SUBSCRIPTIONS

to the Ironmonger and Metal Trades Advertiser, which is sent every fourth week the Foreign Supplement (see below), may commence from any  
date, but are not received for less than a year complete. The rate is \$3 per annum, inclusive of postage to any part of the world outside Great Britain.  
To every subscriber is presented, free, in the course of his year, a handsome and useful Ironmongers' Diary and Text Book, a work sold to non-  
subscribers at 75 cents.

## ADVERTISEMENTS

are inserted in the Ironmonger and Metal Trades Advertiser at the subjoined rates, from which no variation can be made on any ground whatever.

Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in  
the Ironmongers' Diary and Text Book, published toward the end of each year,  
and presented to every Subscriber.

	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	1 INSERTION, net.
One page.....	Gold. \$20.00	Gold. \$22.50	Gold. \$25.00	Gold. \$30.00	Gold. \$35.00	Gold. \$50.00
Two-thirds page.....	15.00	16.90	18.75	22.50	26.25	37.50
Half page.....	11.00	12.40	13.75	16.50	19.25	27.50
One-third page.....	8.00	9.00	10.00	12.00	14.00	20.00
Quarter page.....	6.40	7.25	8.00	9.60	11.20	16.00
One-sixth page.....	4.50	5.10	5.65	6.75	7.75	11.30
One-eighth page.....	3.60	4.10	4.50	5.40	6.25	9.00
One-sixteenth page.....	2.00	2.25	2.50	3.00	3.50	5.00

## SPECIAL ISSUES.

In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than Twelve Thousand (12,000) copies.

## THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual presented free to every Subscriber to the IRONMONGER AND METAL TRADES ADVERTISER.  
It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to  
year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of excep-  
tional value for advertisements. Sold to non-subscribers at 75 cents.

## THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

is published every fourth week in connection with the extensive and world-wide circulation of the Ironmonger itself. The dates of its publication for the  
next twelve months will be as follows:  
JANUARY 25, FEBRUARY 25, MARCH 25, APRIL 22, MAY 20, JUNE 17, JULY 8, AUGUST 5, SEPTEMBER 2 and 30, OCTOBER 22, NOVEMBER  
25 and DECEMBER 23, 1882.

This Supplement is published in

## FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only within reach  
but in the native language of eighty millions of Germany, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish  
speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to  
be found.

Advertisements are inserted in any language at the following

## MODERATE TARIFF.

Size of Page—13½ Inches Deep by 9½ Inches Wide.

	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
One page.....	Gold. \$30.00	Gold. \$33.75	Gold. \$37.50	Gold. \$10.00	Gold. \$11.25	Gold. \$12.50
Two-thirds page.....	22.00	24.75	27.50	7.50	8.45	9.40
Half page.....	17.00	19.15	21.25	6.20	7.00	7.75
One-third page.....	12.50	14.10	15.65	3.20	3.40	4.25

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language can  
be suitably described in four or more languages on the opposite or right page without illustrating.

## THE WHOLE FOREIGN HARDWARE TRADE

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Adverti-  
sement inserted in the Ironmonger and Foreign Supplement is a strikingly powerful and most efficient way of publicity not to be compared with any other  
ordinary channels of communication.



**B. KREISCHER & SONS,**  
**FIRE BRICK.**  
BEST AND CHEAPEST.  
Established 1845.  
Office, foot of Houston Street, East River,  
NEW YORK.

**NEWTON & CO.,**  
ALBANY, N. Y., Manufacturers of  
**FIRE BRICK**  
Stove Linings,  
Range and Heater Linings  
Cylinder Brick, &c., &c.  
For Glass and Steel Works.

**SILICA,**  
Bricks and Cement,  
English Fire Bricks.  
**RIMINGTON BROS. & CO.,**  
Newcastle-on-Tyne.  
Agent on this side

**S. A. RIMINGTON,**  
40 & 42 Broadway,  
NEW YORK.

**M. D. Valentine & Bro**  
Manufacturers of

**FIRE BRICK**  
And Furnace Blocks  
DRAIN PIPE & LAND TILE.  
Woodbridge, - - - N. J.

**BORGNER & O'BRIEN,**  
Manufacturers  
**FIRE BRICK**  
AND  
Edge Pressed Furnace Blocks,  
CLAY RETORTS, TILES, &c.,  
Twenty-third Street,  
Above Race, PHILADELPHIA.  
Twenty years' practical Experience.

**WATSON FIRE BRICK CO.,**  
ESTABLISHED 1836.  
Successors to JOHN R. WATSON, Perth Amboy, New Jersey  
Manufacturers of

**FIRE BRICK,**  
OR ROLLING MILLS, BLAST FURNACES, FOUN-  
DRIES GAS WORKS, LIME KILNS, TANNERIES,  
BOILER AND GRATE SETTING, GLASS WORKS, &c.  
Fire Clays, Fire Sand, and Kaolin for Sale.

**HENRY MAURER,**  
Proprietor of the  
**Excelsior Fire Brick & Clay**  
Retort Works.  
Manufacturer of FIRE BRICK, HOLLOW  
BRICK AND CLAY RETORTS.  
WORKS: PERTH AMBOY, NEW JERSEY.  
Office & Depot 418 to 422 East 23d St., N. Y.

**TROY FIRE BRICK WORKS,**  
Troy, N. Y.,  
**JAMES OSTRANDER & SON,**  
ESTABLISHED 1844.  
Manufacturers of  
**FIRE BRICK,**  
Taylors, Tiles, Blast Furnace Blocks, &c. Miners and  
Dressers. Woodbridge Fire Clay and Sand, and Staten  
Island Kaolin.

Established 1864.  
**GARDNER BROTHERS,**  
Manufacturers of  
**STANDARD SAVAGE FIRE BRICK,**  
TILE & FURNACE BLOCKS,  
OF ALL SHAPES AND SIZES.  
Clay Gas Retorts and Retort Settings, and  
Miners and Shippers of Fire Clay.  
OFFICE: 116 Smithfield St., Pittsburgh, Pa.  
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

**HALL & SONS,**  
**FIRE BRICK,**  
Buffalo, N. Y.  
**CHAS. D. COLSON,**

**FIRE BRICK,**  
Foundry Facings, Sand, Tools and Supplies.  
CHICAGO, ILL.

**UNION MINING COMPANY,**  
**Mount Savage Fire Brick.**  
EDWARD J. ETTING, Agent,  
No. 230 South Third St., Philadelphia, Pa.

**THOMAS MORTON,**  
Manufacturers of  
CABLE, COPPER, IRON AND STEEL SASH CHAINS,  
for suspending window shades. Also, Copper Cham-  
pion Chains, with patent attachments, for same pur-  
pose. Agents wanted in the principal  
United States. Apply at  
63 Elizabeth Street, New

# HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,  
Front and Laurel Streets, PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.

Patented May 29, 1870.

Fig. 2.



Price, - - - \$37.50 per dozen.

No Farmer, Nurseryman, Railroad  
or Telegraph Company  
**SHOULD BE WITHOUT ONE.**

NO BACK-ACHE.

NO KNEE-WORK.

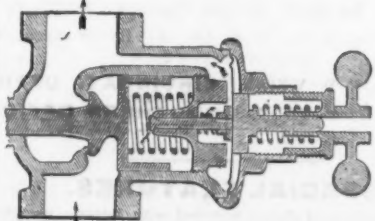
NO CLOGGING.

This tool has been thoroughly tested, and has given  
the greatest satisfaction to all who have tried it. The  
principle on which it works makes it self-cleaning and  
prevents adhesion in sticky soil; therefore it always  
works free and easy. It is far superior to all plungers,  
augers and boring machines, as it works well in stony,  
sandy, or clay soils; quicksand under water is as easily  
removed as though no water existed.

## DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

**HENRY DISSTON & SONS.**

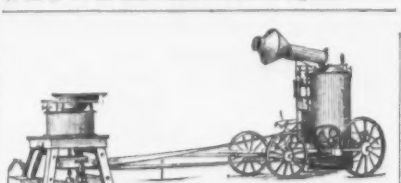


**Curtis Pressure Regulator.**  
Is made entirely of metal; occupies the same space  
as a globe valve. It has no glands or packing, and is  
a lock-up valve. Write for circular. Manufactured by  
**CURTIS REGULATOR CO.,**  
59 Beverly Street, BOSTON, MASS.



**HUBBELL'S**  
PATENT  
**METAL**  
**CORNERS**  
FOR OIL CLOTH,  
With Binding to Match.

Protect them from wearing and are  
ornamental. These goods need only  
be seen by the public; the real merits  
are at once appreciated. Sample  
orders solicited and circulars sent on  
application.



**RAY HUBBELL,**  
Patentee and Sole Manuf'r in U. S. and Canada,  
Northville, Fulton Co., N. Y.

**THE "EDDY" STRAIGHTWAY**  
**VALVES.**  
ALSO,  
**FIRE HYDRANTS.**  
Axe, Hatchet, Powder and  
Brush Machinery.  
**MOHAWK & HUDSON MFG. CO.,**  
WATERFORD, N. Y.  
BENTON, FAULKNER & BIRD, N. Y. Agents.  
C. H. & W. H. MIDDLETON, Phila. Agents.



Gentlemen.—This cut illustrates our  
**CAST IRON**  
**Furnace Lamps**  
which are superseding entirely the Tin Lamps  
wherever introduced, in consequence of their dur-  
ability. They are now extensively used in the  
Iron Districts of Ohio and some in Pennsylvania.  
We call your attention to and solicit your order  
for them, confidently asserting that they are an  
A No. 1 article in every respect.

Sample sent if desired.  
PRICE, \$12 PER DOZEN.

**Taylor & Boggis,**  
CLEVELAND, O.

## MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of  
**Morse Patent Straight-Lip Increase Twist Drill,**  
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,  
**BIT STOCK DRILLS,**

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL  
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER  
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS.  
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING  
CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt.

EDWARD S. TABER, Treas.

**Armstrong's Improved Adjustable Stock and Dies**  
FOR PIPE AND BOLTS.



Tapped to the U. S. and Whitworth Standard Gauges. Adjustable to all variations in the size of  
fittings. Can be resharpened without drawing the temper by simply grinding them. Possessing prac-  
tical advantages appreciated by all mechanics. Circular and Price List sent free on application.  
Manufactured by F. ARMSTRONG, 3rd Starling St., Bridgeport, Conn.

**John T. Lewis & Bros.**  
No. 231 South Front St.,  
PHILADELPHIA.



TRADE MARK.  
MANUFACTURERS OF  
Pure White Lead, Red Lead, Litharge,  
Orange Mineral, Linseed Oil,  
AND PAINTERS' COLORS.

**Brooklyn White Lead Co.**



TRADE MARK  
White Lead, Red Lead & Litharge.  
No. 182 Front Street,  
NEW YORK.

**JOHN JEWETT & SONS**  
Manufacturers of the well-known brand of  
**WHITE LEAD.**



TRADE MARK  
ALSO MANUFACTURERS OF  
**LINSEED OIL.**  
181 Front Street, NEW YORK.



**The Atlantic White Lead and**  
**Linseed Oil Co.,**  
Manufacturers of

White Lead (Atlantic), Red Lead, Lith-  
arge, Glass Makers' Litharge and  
Orange Mineral;  
**LINSEED OIL,**  
Raw, Refined and Boiled.  
**ROBERT COLCATE & CO.,**  
287 Pearl St., NEW YORK.



**R. Onderdonk,**  
Sole Manufacturer of  
**LEVER LEMON**  
**SQUEEZER,**  
With Perforated Strainer.  
405 Grand St.,  
NEW YORK.

Price \$12.00.

Liberal discount to the trade.

Send for Circular.

Manufactured by

**CLARK SINTZ,**

Springfield, Ohio.

**HOWARD IRON WORKS,**

BUFFALO, N. Y.,

Manufacturers of

**BENCH VISES,**

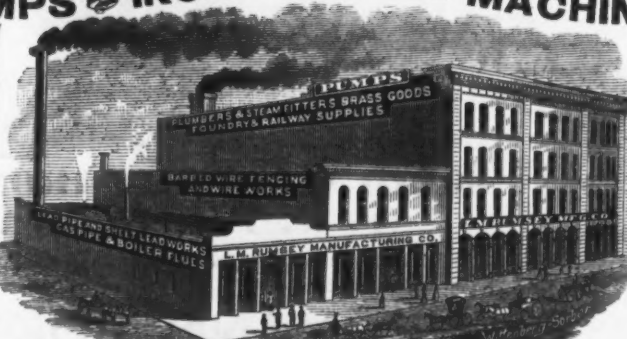
Price Lists sent







**L. M. RUMSEY MFG. CO.**  
MANUFACTURERS & JOBBERS OF  
**PUMPS & IRON WORKING MACHINERY,**



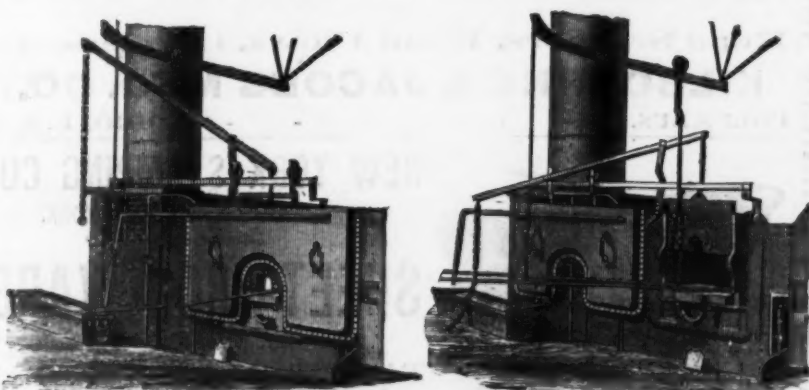
**LEAD PIPE & SHEET LEAD**  
**PLUMBERS & STEAM FITTERS**  
**BRASS GOODS**  
**BARBED WIRE FENCING**  
**ST. LOUIS, MO.**

**RAILWAY SUPPLIES**  
No. 804 TO 820 N. SECOND ST.

**GAS PIPE & FITTINGS**  
**BELTING**  
**HOSE**  
**PACKING**  
**PUMP**  
**CHAIN & C.**

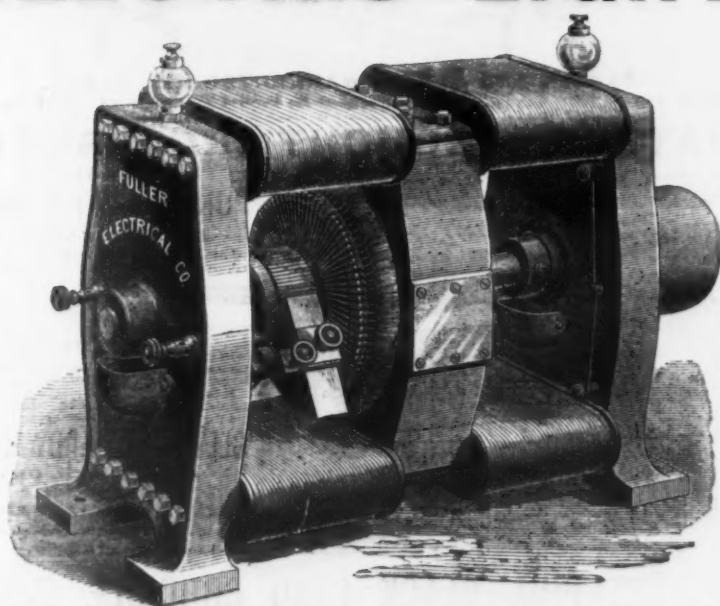
**AMERICAN BOLT CO., Lowell, Mass.,**  
MANUFACTURERS OF  
**Bolts, Nuts, Washers, Chain Links, Car**  
**Bolts, Bridge Bolts, Lag Screws, &c.**

**McDONALD'S**  
**PATENT SHIELD.**



For Protecting the Men from Heat when Working in Front of  
Puddling, Heating and other Furnaces.

**H. McDONALD, Patentee,**  
MANAGER SLIGO ROLLING MILLS,  
PITTSBURGH, PA.  
**ELECTRIC LIGHT.**



**THE FULLER ELECTRICAL COMPANY,** having perfected their system of Electric  
Lighting, are prepared to furnish the **Improved Gramme Dynamo Electric Machines and**  
**Electric Lamps,** either for single lights or for from 2 to 20 lights in one circuit.  
This apparatus is unexcelled for **durability, steadiness of light and economy of power,**  
and requires less attention than any other.  
For price list and further particulars apply to

**THE FULLER ELECTRICAL COMPANY,**  
44 East Fourteenth Street, NEW YORK.

**STATIONARY AND PORTABLE**  
**STEAM ENGINES,**  
Shafting, Hangers, Pulleys and Gearing.

**SAW MILLS,**  
Hoisting Engines and Mining Machinery.

Address, **LANE & BODLEY CO.,**  
John and Water Streets, CINCINNATI, OHIO, U. S. A.

**THE DETROIT**  
**LUBRICATOR MFG. CO.'S**  
CONTINUOUS FEED  
**Lubricator Cups**

Through the Steam Pipe

The oil passes in sight, drop by drop, into the column of steam where it vaporizes, thus becoming a steam lubricant, oiling perfectly every part reached by the steam. Any clean oil, black or white, light or heavy, may be used. Saves from 50 to 60 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on twenty days' trial, if desired. In ordering give diameter of cylinder.

**NOTICE.**—The first Lubricator ever made, showing the oil passing drop by drop through a transparent water chamber, were devised by us, and the same are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above feature, made by other parties, are encroachments upon our rights, and we will hold purchasers and users, as well as manufacturers, responsible in damages for such violations.

Address  
**DETROIT LUBRICATOR MFG. CO.,**  
Office, 98 Griswold St., Detroit, Mich.  
First Prize at Fair American Institute and Millers' International Exposition, Cincinnati, 1880.  
Notice.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their right of priority, a decree was rendered in our favor August 20, 1881.

**DETROIT LUBRICATOR MFG. CO.,**  
Office, 98 Griswold St., Detroit, Mich.  
First Prize at Fair American Institute and Millers' International Exposition, Cincinnati, 1880.  
Notice.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their right of priority, a decree was rendered in our favor August 20, 1881.

**HILDEBRAND**  
**PUMP AND TANK.**  
Economical, saves all the oil, reduces insurance. The best arrangement extant. Can be used in tank, No measure or funnel used.

**THE YOUNGSTOWN**  
**MEASURING PUMP CO.,**  
Sole Manufacturers,  
YOUNGSTOWN, O.  
Every Pump guaranteed to be just what we claim for it.  
For further information address Company, as above.

**Flanders Radius Planer.**

For planing Links, Blocks and circular work on ordinary planer.  
Price and descriptive circular on application.

**L. B. FLANDERS MACHINE WORKS,**  
1025 Hamilton St., Philadelphia, Pa.

**Mellert Foundry & Machine Co.,**  
Limited.  
(Works Established at Reading, Pa., in 1841.)  
Manufacturers of

Specials, Flange Pipe, Refractories, Valves and Hydrants, Lamp Posts, &c. The Improved Canadian Turbine Water Wheel, Machinery and Castings for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c. Columns, Brackets, Iron Railings, &c.

Office:  
Second and Chestnut Sts., Reading, Pa., and  
74 Pine Street, New York City.

**BUFFALO SCALE CO.,**  
BUFFALO, N. Y.,  
Manufacturers of

**R. R. Track Scales, Hay Scales, Coal**  
**Scales, Grain Scales, Platform**  
**Scales, Counter Scales, &c.**  
Send for price list, stating what you want.

**WANTED—10,000 MECHANICS**

To send Five cents each for sample of the  
Rolling Mill Crayons and Mechanics' Companion  
The handiest and cheapest marker for any kind  
of work with or to carry in the pocket. Sent  
post paid on receipt of 5 cents.

**D. M. STEWARD, Sole Manufacturer,**  
331 State Avenue, Cincinnati, Ohio.

**J. F. WOLLENSAK'S**

PATENT

**Transom**  
**Lifter**  
**and Lock.**

For all kinds  
of Transoms,  
Fanlights and  
Skylights.

Send for catalogue  
and price list.

**J. F. WOLLENSAK,**  
Patentee and Sole Manufacturer,  
CHICAGO, ILL.

**THE DUPLEX INJECTOR.**

The Best Boiler Feeder  
Known.

Unequalled for simplicity and always reliable. Does not require adjustment for varying pressures of steam. Will start when the injector is hot. Less liable to get out of order than a pump. Always delivers water hot to the boiler.

Manufactured and for Sale by  
**JAMES JENKS,**  
16 & 18 Atwater St., East,  
DETROIT, MICH.

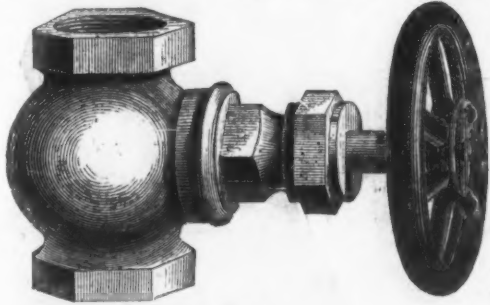
**BOSTON.**

Reported by Macomber, Bigelow & Douse.

**Avails.**—“Eagle American”..... \$ 1.50  
**Avail & Vice.**—  
No. 1, \$1.25; 2, 4, 25; 3, 5, 50 each..... \$ 2.50  
**Angers & Bitts.**—Snell's Auger..... \$1.00  
L. Hommedieu's Ship Auger..... \$1.15  
Jennings' Bitts..... \$1.00  
Cook's Bitts..... \$1.00  
Shepardson's Double Glimlets..... \$1.45  
Shepardson's Double Glimlets..... \$1.45  
Steam's Extension Hollow Augers—  
No. 2, 2 ft. 6 in., No. 3, 3 ft. 6 in., No. 4, 4 ft. 6 in., No. 5, 5 ft. 6 in., No. 6, 6 ft. 6 in., No. 7, 7 ft. 6 in., No. 8, 8 ft. 6 in., No. 9, 9 ft. 6 in., No. 10, 10 ft. 6 in., No. 11, 11 ft. 6 in., No. 12, 12 ft. 6 in., No. 13, 13 ft. 6 in., No. 14, 14 ft. 6 in., No. 15, 15 ft. 6 in., No. 16, 16 ft. 6 in., No. 17, 17 ft. 6 in., No. 18, 18 ft. 6 in., No. 19, 19 ft. 6 in., No. 20, 20 ft. 6 in., No. 21, 21 ft. 6 in., No. 22, 22 ft. 6 in., No. 23, 23 ft. 6 in., No. 24, 24 ft. 6 in., No. 25, 25 ft. 6 in., No. 26, 26 ft. 6 in., No. 27, 27 ft. 6 in., No. 28, 28 ft. 6 in., No. 29, 29 ft. 6 in., No. 30, 30 ft. 6 in., No. 31, 31 ft. 6 in., No. 32, 32 ft. 6 in., No. 33, 33 ft. 6 in., No. 34, 34 ft. 6 in., No. 35, 35 ft. 6 in., No. 36, 36 ft. 6 in., No. 37, 37 ft. 6 in., No. 38, 38 ft. 6 in., No. 39, 39 ft. 6 in., No. 40, 40 ft. 6 in., No. 41, 41 ft. 6 in., No. 42, 42 ft. 6 in., No. 43, 43 ft. 6 in., No. 44, 44 ft. 6 in., No. 45, 45 ft. 6 in., No. 46, 46 ft. 6 in., No. 47, 47 ft. 6 in., No. 48, 48 ft. 6 in., No. 49, 49 ft. 6 in., No. 50, 50 ft. 6 in., No. 51, 51 ft. 6 in., No. 52, 52 ft. 6 in., No. 53, 53 ft. 6 in., No. 54, 54 ft. 6 in., No. 55, 55 ft. 6 in., No. 56, 56 ft. 6 in., No. 57, 57 ft. 6 in., No. 58, 58 ft. 6 in., No. 59, 59 ft. 6 in., No. 60, 60 ft. 6 in., No. 61, 61 ft. 6 in., No. 62, 62 ft. 6 in., No. 63, 63 ft. 6 in., No. 64, 64 ft. 6 in., No. 65, 65 ft. 6 in., No. 66, 66 ft. 6 in., No. 67, 67 ft. 6 in., No. 68, 68 ft. 6 in., No. 69, 69 ft. 6 in., No. 70, 70 ft. 6 in., No. 71, 71 ft. 6 in., No. 72, 72 ft. 6 in., No. 73, 73 ft. 6 in., No. 74, 74 ft. 6 in., No. 75, 75 ft. 6 in., No. 76, 76 ft. 6 in., No. 77, 77 ft. 6 in., No. 78, 78 ft. 6 in., No. 79, 79 ft. 6 in., No. 80, 80 ft. 6 in., No. 81, 81 ft. 6 in., No. 82, 82 ft. 6 in., No. 83, 83 ft. 6 in., No. 84, 84 ft. 6 in., No. 85, 85 ft. 6 in., No. 86, 86 ft. 6 in., No. 87, 87 ft. 6 in., No. 88, 88 ft. 6 in., No. 89, 89 ft. 6 in., No. 90, 90 ft. 6 in., No. 91, 91 ft. 6 in., No. 92, 92 ft. 6 in., No. 93, 93 ft. 6 in., No. 94, 94 ft. 6 in., No. 95, 95 ft. 6 in., No. 96, 96 ft. 6 in., No. 97, 97 ft. 6 in., No. 98, 98 ft. 6 in., No. 99, 99 ft. 6 in., No. 100, 100 ft. 6 in., No. 101, 101 ft. 6 in., No. 102, 102 ft. 6 in., No. 103, 103 ft. 6 in., No. 104, 104 ft. 6 in., No. 105, 105 ft. 6 in., No. 106, 106 ft. 6 in., No. 107, 107 ft. 6 in., No. 108, 108 ft. 6 in., No. 109, 109 ft. 6 in., No. 110, 110 ft. 6 in., No. 111, 111 ft. 6 in., No. 112, 112 ft. 6 in., No. 113, 113 ft. 6 in., No. 114, 114 ft. 6 in., No. 115, 115 ft. 6 in., No. 116, 116 ft. 6 in., No. 117, 117 ft. 6 in., No. 118, 118 ft. 6 in., No. 119, 119 ft. 6 in., No. 120, 120 ft. 6 in., No. 121, 121 ft. 6 in., No. 122, 122 ft. 6 in., No. 123, 123 ft. 6 in., No. 124, 124 ft. 6 in., No. 125, 125 ft. 6 in., No. 126, 126 ft. 6 in., No. 127, 127 ft. 6 in., No. 128, 128 ft. 6 in., No. 129, 129 ft. 6 in., No. 130, 130 ft. 6 in., No. 131, 131 ft. 6 in., No. 132, 132 ft. 6 in., No. 133, 133 ft. 6 in., No. 134, 134 ft. 6 in., No. 135, 135 ft. 6 in., No. 136, 136 ft. 6 in., No. 137, 137 ft. 6 in., No. 138, 138 ft. 6 in., No. 139, 139 ft. 6 in., No. 140, 140 ft. 6 in., No. 141, 141 ft. 6 in., No. 142, 142 ft. 6 in., No. 143, 143 ft. 6 in., No. 144, 144 ft. 6 in., No. 145, 145 ft. 6 in., No. 146, 146 ft. 6 in., No. 147, 147 ft. 6 in., No. 148, 148 ft. 6 in., No. 149, 149 ft. 6 in., No. 150, 150 ft. 6 in., No. 151, 151 ft. 6 in., No. 152, 152 ft. 6 in., No. 153, 153 ft. 6 in., No. 154, 154 ft. 6 in., No. 155, 155 ft. 6 in., No. 156, 156 ft. 6 in., No. 157, 157 ft. 6 in., No. 158, 158 ft. 6 in., No. 159, 159 ft. 6 in., No. 160, 160 ft. 6 in., No. 161, 161 ft. 6 in., No. 162, 162 ft. 6 in., No. 163, 163 ft. 6 in., No. 164, 164 ft. 6 in., No. 165, 165 ft. 6 in., No. 166, 166 ft. 6 in., No. 167, 167 ft. 6 in., No. 168, 168 ft. 6 in., No. 169, 169 ft. 6 in., No. 170, 170 ft. 6 in., No. 171, 171 ft. 6 in., No. 172, 172 ft. 6 in., No. 173, 173 ft. 6 in., No. 174, 174 ft. 6 in., No. 175, 175 ft. 6 in., No. 176, 176 ft. 6 in., No. 177, 177 ft. 6 in., No. 178, 178 ft. 6 in., No. 179, 179 ft. 6 in., No. 180, 180 ft. 6 in., No. 181, 181 ft. 6 in., No. 182, 182 ft. 6 in., No. 183, 183 ft. 6 in., No. 184, 184 ft. 6 in., No. 185, 185 ft. 6 in., No. 186, 186 ft. 6 in., No. 187, 187 ft. 6 in., No. 188, 188 ft. 6 in., No. 189, 189 ft. 6 in., No. 190, 190 ft. 6 in., No. 191, 191 ft. 6 in., No. 192, 192 ft. 6 in., No. 193, 193 ft. 6 in., No. 194, 194 ft. 6 in., No. 195, 195 ft. 6 in., No. 196, 196 ft. 6 in., No. 197, 197 ft. 6 in., No. 198, 198 ft. 6 in., No. 199, 199 ft. 6 in., No. 200, 200 ft. 6 in., No. 201, 201 ft. 6 in., No. 202, 202 ft. 6 in., No. 203, 203 ft. 6 in., No. 204, 204 ft. 6 in., No. 205, 205 ft. 6 in., No. 206, 206 ft. 6 in., No. 207, 207 ft. 6 in., No. 208, 208 ft. 6 in., No. 209, 209 ft. 6 in., No. 210, 210 ft. 6 in., No. 211, 211 ft. 6 in., No. 212, 212 ft. 6 in., No. 213, 213 ft. 6 in., No. 214, 214 ft. 6 in., No. 215, 215 ft. 6 in., No. 216, 216 ft. 6 in., No. 217, 217 ft. 6 in., No. 218, 218 ft. 6 in., No. 219, 219 ft. 6 in., No. 220, 220 ft. 6 in., No. 221, 221 ft. 6 in., No. 222, 222 ft. 6 in., No. 223, 223 ft. 6 in., No. 224, 224 ft. 6 in., No. 225, 225 ft. 6 in., No. 226, 226 ft. 6 in., No. 227, 227 ft. 6 in., No. 228, 228 ft. 6 in., No. 229, 229 ft. 6 in., No. 230, 230 ft. 6 in., No. 231, 231 ft. 6 in., No. 232, 232 ft. 6 in., No. 233, 233 ft. 6 in., No. 234, 234 ft. 6 in., No. 235, 235 ft. 6 in., No. 236, 236 ft. 6 in., No. 237, 237 ft. 6 in., No. 238, 238 ft. 6 in., No. 239, 239 ft. 6 in., No. 240, 240 ft. 6 in., No. 241, 241 ft. 6 in., No. 242, 242 ft. 6 in., No. 243, 243 ft. 6 in., No. 244, 244 ft. 6 in., No. 245, 245 ft. 6 in., No. 246, 246 ft. 6 in., No. 247, 247 ft. 6 in., No. 248, 248 ft. 6 in., No. 249, 249 ft. 6 in., No. 250, 250 ft. 6 in., No. 251, 251 ft. 6 in., No. 252, 252 ft. 6 in., No. 253, 253 ft. 6 in., No. 254, 254 ft. 6 in., No. 255, 255 ft. 6 in., No. 256, 256 ft. 6 in., No. 257, 257 ft. 6 in., No. 258, 258 ft. 6 in., No. 259, 259 ft. 6 in., No. 260, 260 ft. 6 in., No. 261, 261 ft. 6 in., No. 262, 262 ft. 6 in., No. 263, 263 ft. 6 in., No. 264, 264 ft. 6 in., No. 265, 265 ft. 6 in., No. 266, 266 ft. 6 in., No. 267, 267 ft. 6 in., No. 268, 268 ft. 6 in., No. 269, 269 ft. 6 in., No. 270, 270 ft. 6 in., No. 271, 271 ft. 6 in., No. 272, 272 ft. 6 in., No. 273, 273 ft. 6 in., No. 274, 274 ft. 6 in., No. 275, 275 ft. 6 in., No. 276, 276 ft. 6 in., No. 277, 277 ft. 6 in., No. 278, 278 ft. 6 in., No. 279, 279 ft. 6 in., No. 280, 280 ft. 6 in., No. 281, 281 ft. 6 in., No. 282, 282 ft. 6 in., No. 283, 283 ft. 6 in., No. 284, 284 ft. 6 in., No. 285, 285 ft. 6 in., No. 286, 286 ft. 6 in., No. 287, 287 ft. 6 in., No. 288, 288 ft. 6 in., No. 289, 289 ft. 6 in., No. 290, 290 ft. 6 in., No. 291, 291 ft. 6 in., No. 292, 292 ft. 6 in., No. 293, 293 ft. 6 in., No. 294, 294 ft. 6 in., No. 295, 295 ft. 6 in., No. 296, 296 ft. 6 in., No. 297, 297 ft. 6 in., No. 298, 298 ft. 6 in., No. 299, 299 ft. 6 in., No. 300, 300 ft. 6 in., No. 301, 301 ft. 6 in., No. 302, 302 ft. 6 in., No. 303, 303 ft. 6 in., No. 304, 304 ft. 6 in., No. 305, 305 ft. 6 in., No. 306, 306 ft. 6 in., No. 307, 307 ft. 6 in., No. 308, 308 ft. 6 in., No. 309, 309 ft. 6 in., No. 310, 310 ft. 6 in., No. 311, 311 ft. 6 in., No. 312, 312 ft. 6 in., No. 313, 313 ft. 6 in., No. 314, 314 ft. 6 in., No. 315, 315 ft. 6 in., No. 316, 316 ft. 6 in., No. 317, 317 ft. 6 in., No. 318, 318 ft. 6 in., No. 319, 319 ft. 6 in., No. 320, 320 ft. 6 in., No. 321, 321 ft. 6 in., No. 322, 322 ft. 6 in., No. 323, 323 ft. 6 in., No. 324, 324 ft. 6 in., No. 325, 325 ft. 6 in., No. 326, 326 ft. 6 in., No. 327, 327 ft. 6 in., No. 328, 328 ft. 6 in., No. 329, 329 ft. 6 in., No. 330, 330 ft. 6 in., No. 331, 331 ft. 6 in., No. 332, 332 ft. 6 in., No. 333, 333 ft. 6 in., No. 334, 334 ft. 6 in., No. 335, 335 ft. 6 in., No. 336, 336 ft. 6 in., No. 337, 337 ft. 6 in., No. 338, 338 ft. 6 in., No. 339, 339 ft. 6 in., No. 340, 340 ft. 6 in., No. 341, 341 ft. 6 in., No. 342, 342 ft. 6 in., No. 343, 343 ft. 6 in., No. 344, 344 ft. 6 in., No. 345, 345 ft. 6 in., No. 346, 346 ft. 6 in., No. 347, 347 ft. 6 in., No. 348, 348 ft. 6 in., No. 349, 349 ft. 6 in., No. 350, 350 ft. 6 in., No. 351, 351 ft. 6 in., No. 352, 352 ft. 6 in., No. 353, 353 ft. 6 in., No. 354, 354 ft. 6 in., No. 355, 355 ft. 6 in., No. 356, 356 ft. 6 in., No. 357, 357 ft. 6 in., No. 358, 358 ft. 6 in., No. 359, 359 ft. 6 in., No. 360, 360 ft. 6 in., No. 361, 361 ft. 6 in., No. 362, 362 ft. 6 in., No. 363, 363 ft. 6 in., No. 364, 364 ft. 6 in., No. 365, 365 ft. 6 in., No. 366, 366 ft. 6 in., No. 367, 367 ft. 6 in., No. 368, 368 ft. 6 in., No. 369, 369 ft. 6 in., No. 370, 370 ft. 6 in., No. 371, 371 ft. 6 in., No. 372, 372 ft. 6 in., No. 373, 373 ft. 6 in., No. 374, 374 ft. 6 in., No. 375, 375 ft. 6 in., No. 376, 376 ft. 6 in., No. 377, 377 ft. 6 in., No. 378, 378 ft. 6 in., No. 379, 379 ft. 6 in., No. 380, 380 ft. 6 in., No. 381, 381 ft. 6 in., No. 382, 382 ft. 6 in., No. 383, 383 ft. 6 in., No. 384, 384 ft. 6 in., No. 385, 385 ft. 6 in., No. 386, 386 ft. 6 in., No. 387, 387 ft. 6 in., No. 388, 388 ft. 6 in., No. 389, 389 ft. 6 in., No. 390, 390 ft. 6 in., No. 391, 391 ft. 6 in., No. 392, 392 ft. 6 in., No. 393, 393 ft. 6 in., No. 394, 394 ft. 6 in., No. 395, 395 ft. 6 in., No. 396, 396 ft. 6 in., No. 397, 397 ft. 6 in., No. 398, 398 ft. 6 in., No. 399, 399 ft. 6 in., No. 400, 400 ft. 6 in., No. 401, 401 ft. 6 in., No. 402, 402 ft. 6 in., No. 403, 403 ft. 6 in., No. 404, 404 ft. 6 in., No. 405, 405 ft. 6 in., No. 406, 406 ft. 6 in., No. 407, 407 ft. 6 in., No. 408, 408 ft. 6 in., No. 409, 409 ft. 6 in., No. 410, 410 ft. 6 in., No. 411, 411 ft. 6 in., No. 412, 412 ft. 6 in., No. 413, 413 ft. 6 in., No. 414, 414 ft. 6 in., No. 415, 415 ft. 6 in., No. 416, 416 ft. 6 in., No. 417, 417 ft. 6 in., No. 418, 418 ft. 6 in., No. 419, 419 ft. 6 in., No. 420, 420 ft. 6 in., No. 421, 421 ft. 6 in., No. 422, 422 ft. 6 in., No. 423, 423 ft. 6 in., No. 424, 424 ft. 6 in., No. 425, 425 ft. 6 in., No. 426, 426 ft. 6 in., No. 427, 427 ft. 6 in., No. 428, 428 ft. 6 in., No. 429, 429 ft. 6 in., No. 430, 430 ft. 6 in., No. 431, 431 ft. 6 in., No. 432, 432 ft. 6 in., No. 433, 433 ft. 6 in., No. 434, 434 ft. 6 in., No. 435, 435 ft. 6 in., No. 436, 436 ft. 6 in., No. 437, 437 ft. 6 in., No. 438, 438 ft. 6 in., No. 439, 439 ft. 6 in., No. 440, 440 ft. 6 in., No. 441, 441 ft. 6 in., No. 442, 442 ft. 6 in., No. 443, 443 ft. 6 in., No. 444, 444 ft. 6 in., No. 445, 445 ft. 6 in., No. 446, 446 ft. 6 in., No. 447, 447 ft. 6 in., No. 448, 448 ft. 6 in., No. 449, 449 ft. 6 in., No. 450, 450 ft. 6 in., No. 451, 451 ft. 6 in., No. 452, 452 ft. 6 in., No. 453, 453 ft. 6 in., No. 454, 454 ft. 6 in., No. 455, 455 ft. 6 in., No. 456, 456 ft. 6 in., No. 457, 457 ft. 6 in., No. 458, 458 ft. 6 in., No. 459, 459 ft. 6 in., No. 460, 460 ft. 6 in., No. 461, 461 ft. 6 in., No. 462, 462 ft. 6 in., No. 463, 463 ft. 6 in., No. 464, 464 ft. 6 in., No. 465, 465 ft. 6 in., No. 466, 466 ft. 6 in., No. 467, 467 ft. 6 in., No. 468, 468 ft. 6 in., No. 469, 469 ft. 6 in., No. 470, 470 ft. 6 in., No. 471, 471 ft. 6 in., No. 472, 472 ft. 6 in., No. 473, 473 ft. 6 in., No. 474, 474 ft. 6 in., No. 475, 475 ft. 6 in., No. 476, 476 ft. 6 in., No. 477, 477 ft. 6 in., No. 478, 478 ft. 6 in., No. 479, 479 ft. 6 in., No. 480, 480 ft. 6 in., No. 481, 481 ft. 6 in., No. 482, 482 ft. 6 in., No. 483, 483 ft. 6 in., No. 484, 484 ft. 6 in., No. 485, 485 ft. 6 in., No. 486, 486 ft. 6 in., No. 487, 487 ft. 6 in., No. 488, 488 ft. 6 in., No. 489, 489 ft. 6 in., No. 490, 490 ft. 6 in., No. 491, 491 ft. 6 in., No. 492, 492 ft. 6 in., No. 493, 493 ft. 6 in., No. 494, 494 ft. 6 in., No. 495, 495 ft. 6 in., No. 496, 496 ft. 6 in., No. 497, 497 ft. 6 in., No. 498, 498 ft. 6 in., No. 499, 499 ft. 6 in., No. 500, 500 ft. 6 in., No. 501, 501 ft. 6 in., No. 502, 502 ft. 6 in., No. 503, 503 ft. 6 in., No. 504, 504 ft. 6 in., No. 505, 505 ft. 6 in., No. 506, 506 ft. 6 in., No. 507, 507 ft. 6 in., No. 508, 508 ft. 6 in., No. 509, 509 ft. 6 in., No. 510, 510 ft. 6 in., No. 511, 511 ft. 6 in., No. 512, 512 ft. 6 in., No. 513, 513 ft. 6 in., No. 514, 514 ft. 6 in., No. 515, 515 ft. 6 in., No. 516, 516 ft. 6 in., No. 517, 517 ft. 6 in., No. 518, 518 ft. 6 in., No. 519, 519 ft. 6 in., No. 520, 520 ft. 6 in., No. 521, 521 ft. 6 in., No. 522, 522 ft. 6 in., No. 523, 523 ft. 6 in., No. 524, 524 ft. 6 in., No. 525, 525 ft. 6 in



**McNab & Harlin Mfg. Co.,**  
MANUFACTURERS OF  
**BRASS COCKS AND VALVES,**  
For STEAM,  
WATER  
and GAS.  
**WROUGHT IRON  
PIPE AND FITTINGS,  
PLUMBERS' MATERIALS**  
Factory, Paterson, N. J. 56 John Street, N. Y.





**BLACK AND TINNED IRON RIVETS.**

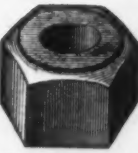


**W. P. TOWNSEND & CO.,**  
PITTSBURGH, PA.,  
Manufacturers of every description of First Quality  
**RIVETS.**  
HENRY B. NEWHALL,  
105 Chambers St.,  
New York Agent.

**WM. H. HASKELL & CO.,**  
Pawtucket, R. I.  
MANUFACTURERS OF  
**COACH SCREWS,**  
(With Gimlet Points),  
ALL KINDS OF  
Machine and Plow Bolts,  
AND  
TAP BOLTS.  
HENRY B. NEWHALL,  
105 Chambers St.,  
New York Agent.


**STANDARD NUT CO.,**  
Pittsburgh, Pa.,  
MANUFACTURERS OF  
**HOT PRESSED  
Square & Hexagon Nuts,**  
**R. R. FISH BARS,  
BOLTS,  
SPIKES,  
RIVETS, &c.**  
HENRY B. NEWHALL,  
105 Chambers St.,  
New York Agent.

**Philadelphia "STAR" Bolt Works.**  
NORWAY IRON FANCY HEAD BOLTS,  
Carriage & Tire Bolts. Star Axle Clips, &c.  
TOWNSEND, WILSON & HUBBARD, 2301 Cherry Street, Philadelphia, Pa



**MACHINE, PATCH AND STAY BOLTS.**  
**HOOPE & TOWNSEND,**  
**KEYSTONE  
BOILER RIVETS**  
**PHILADELPHIA.**  
WOOD SCREWS, TANK RIVETS, FLAT LINK CHAIN.



**BAGNALL & LOUD,**  
BOSTON, MASS.,  
Sole Manufacturers in U. S. A. of our Cele-  
brated  
**METALINE  
AND  
Star Roller Bush  
Tackle Blocks.**  
Send For Illustrated Catalogue.  
New York Warehouse, 33 South St.




**LIGHTNING HAY KNIVES.**  
WEYMOUTH'S PATENT.  
This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.  
The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it seems destined to take the place of all other Hay Knives.  
They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.  
MANUFACTURED ONLY BY  
**HIRAM HOLT & CO.,**  
East Wilton, Franklin Co., Maine.  
For sale by the Hardware Trade generally.

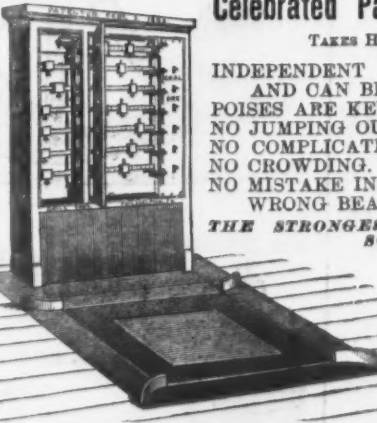



**NORWAY IRON CARRIAGE & TIRE BOLTS.**  
**Axle Clips, &c.**

**COLEMAN EAGLE BOLT WORKS,**  
**WELSH & LEA,** Philadelphia, Pa.  
**F. M. HASLETT & CO.,**  
MANUFACTURERS OF  
Carriage, Machine and Skein Bolts, Lag Screws, &c.  
**ALLEGHENY, PA.**  
W. K. ROSS, J. A. FULLER, W. K. FULLER, Sole Agents,  
97 Chambers Street, New York.



**RIEHLÉ BROTHERS'**  
Celebrated Patented Furnace Charging Scale.  
TAKES HIGHEST PREMIUM WHENEVER EXHIBITED.  
INDEPENDENT BEAMS. EACH BEAM IS NUMBERED  
AND CAN BE SEEN TO OPERATE.  
POISES ARE KEVED AND CANNOT SLIP.  
NO JUMPING OUT OF BEAM.  
NO COMPLICATED JOINTED LEVERS TO RAISE BEAM.  
NO CROWDING.  
NO MISTAKE IN LOOKING AT INDICATOR AND USING  
WRONG BEAM.  
THE STRONGEST AND ONLY PERFECT CHARGING  
SCALE IN THE MARKET,  
and always preferred by experienced furnacemen.  
Ask any furnaceman.  
Send for Circulars and Prices.  
**RIEHLÉ BROS.,**  
Works, 9th above Master.  
Store, 4th above Chestnut. PHILADEL'A.  
Send for prices of Scales and Testing Machines of all  
kinds. Tests of material made daily.

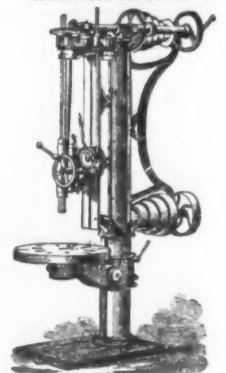


**W. C. WREN'S PATENT GRATE BAR.**  
**DAVID S. CRESWELL,** Manufacturer,  
816 Race Street, PHILADELPHIA, PA.  
The most durable Grate Bar on the market. Send for circular and price list.



**P. BLAISDELL & CO.,**  
WORCESTER, MASS

Manufacturers of the  
**"BLAISDELL" UPRIGHT DRILLS**  
And other First-Class Machinists' Tools.



**J. F. FRENTZEL,**  
Manufacturer of  
**Dash Board  
LANTERNS**  
143 Market Street,  
PHILADELPHIA, PA.



**HOLT  
PORTABLE FORGES**  
Manufactured by  
**HOLT MFG. CO.**  
Cleveland, Ohio.  
New York Warerooms  
79 & 81 Reade St.  
F. PORTER THAYER,  
Manager.



**PITTSBURGH MFG. CO.**  
Manufacturers of Nail and Spike Machines, Bolt,  
Nuts, Washers, Rivets, &c. Castings, Forgings  
and Blacksmith Work promptly attended to.  
OFFICE & WORKS, Railroad St. near 28th., Pittsburgh, Pa.  
**THE LA FRANCE FIRE ENGINE CO.**  
Manufacturers of



**Rotary Steam Fire Engines**  
**ELMIRA, N. Y.**  
Bohren's Improved  
PAT. JAN. 4, 1876.  
Rubber Ball Faucet.  
The best Wood and Metal Faucet yet made.  
Never leaks, splits or shrinks. Is as durable as  
the brass stop-cock and is much cheaper. It  
does not poison the liquids. It is especially  
adapted for Export, as it is not affected by  
shrinkage.  
U. BOHREN & CO., Manufacturers,  
259 West 27th Street, New York.  
Send for Circular and Price List.

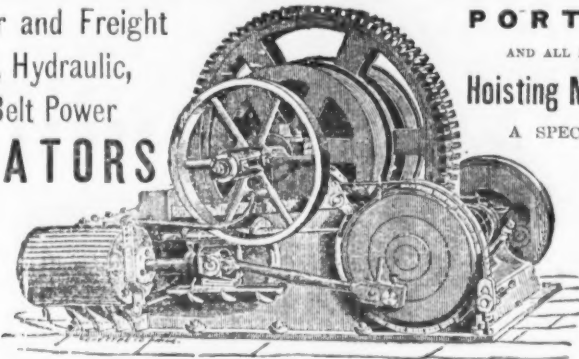


**JOHN H. WRIGHT,**  
Manufacturer of  
**MACHINISTS' TOOLS**  
FROM THE LATE  
**WOOD, LIGHT & CO.'S PATTERNS**  
Of Lathes and Planers.  
Mr. Wright having formerly been a contractor  
in building the same, will give superior work to all  
who favor him with their orders.  
**Gear Cutting a Specialty.**  
237 Water Street,  
BRIDGEPORT, CONN.





Passenger and Freight  
Steam, Hydraulic,  
and Belt Power  
**ELEVATORS**



**PORTABLE**  
AND ALL KINDS OF  
**Hoisting Machinery**  
A SPECIALTY.

## IRON FURNACE HOIST.

For Handling Stock to Top of Stack with One or Two Platforms.  
**STOKES & PARRISH, 3001 Chestnut St., Philadelphia**

\$\$\$ **SAVED** \$\$\$

**1977** NINETEEN HUNDRED SEVENTY-SEVEN **1977**  
**MACHINES**  
**BOTH NEW AND SECOND-HAND**

COMPRISING  
MACHINE AND BLACKSMITH  
TOOLS OF EVERY DESCRIPTION.  
WOOD-WORKING MACHINERY IN ALL ITS  
BRANCHES. PORTABLE ENGINES. UPRIGHT and HOR-  
IZONTAL STATIONARY ENGINES. 1 TO  
300 HORSE POWER. **S.C.F. & CO.** LOCOMOTIVE FIRE-  
BOX, HORIZONTAL, and UPRIGHT BOIL-  
ERS, 1 TO 100 HORSE POWER. WATER WHEELS, COT-  
TON AND WOOLEN MACHINERY, STEAM  
PUMPS, CRISTMILL MACHINERY,  
Etc., FULLY DESCRIBED, AND  
PRICES ANNEXED.

Send stamp for same.

In our List No. 23.

[stating what you want.]

We have the Largest Assortment of Machinery to be  
found in the hands of any firm in the country.

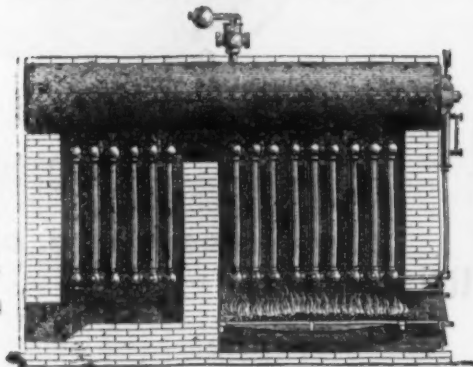
Works and Main Office,  
Manchester, N. H.

**S. C. FORSAITH & CO.**

Branch Office and Wareroom, 209 Center street, New York City.

## DUPLUX SAFETY BOILER.

Unequalled Economy.



Positive circulation, insuring un-  
der all circumstances a clean boiler.  
No sediment. The best materials.  
No joints, but expanded joints in  
combustion chamber.

The most durable boiler made.  
Send for circular.

**DUPLUX SAFETY BOILER CO.,**

34 Cortlandt Street,

NEW YORK.

Chicago Office,

45 Franklin Street.



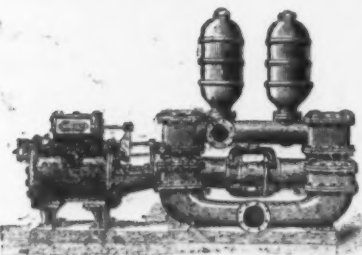
Patent Felt and Asbestos Non-Conducting Removable Covering.

Easily Applied by Any One.

For steam boilers and pipes, hot and cold water pipes, refrigerators, meat cans, ice houses, &c.

Also Patent "Air Space" Non-conducting Cements, Hair Felt, the National Steel Tube Cleaner,  
Asbestos Materials, &c.

## KEYSTONE STEAM PUMP WORKS, PUMPS



**PUMPING MACHINERY**

Of all Kinds.

**THOMPSON, EPPING & CARPENTER,**  
**PITTSBURGH, PA.**

ADAM HEINZ.

GEO. J. MUNSCHAUER.

MICHAEL J. STARK.

**NIAGARA STAMPING & TOOL CO.,**

Manufacturers of

Presses, Dies and Tools for Working Sheet Metal,  
FRUIT CAN AND TINNERS' TOOLS, &c.

Works, 147 and 149 Elm Street, near Clinton Street,

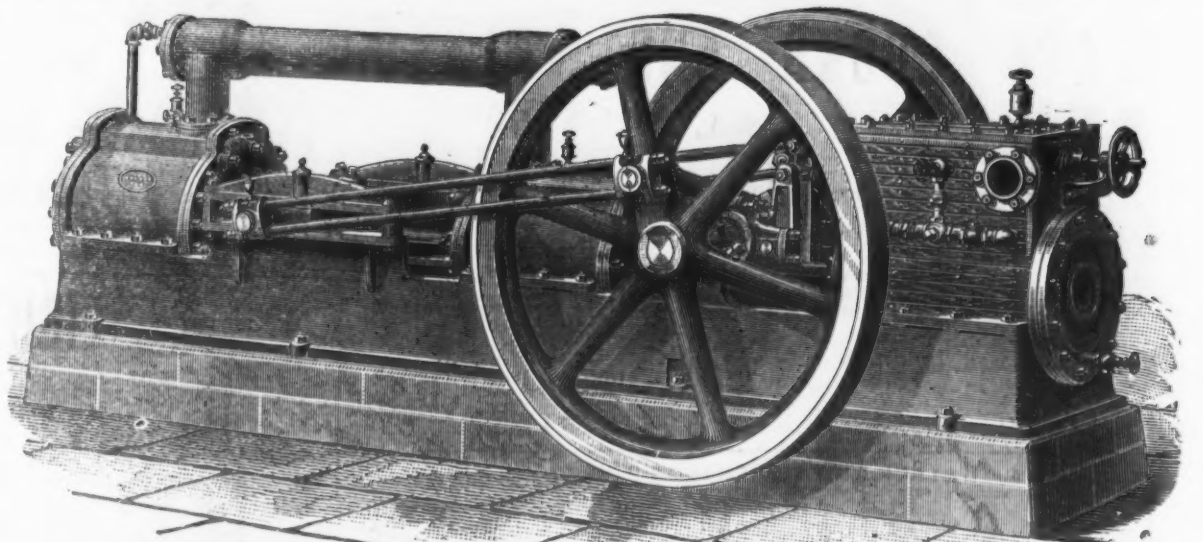
**BUFFALO, N. Y.**

**THORNE, DeHAVEN & CO., Drilling Machines,**  
21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.  
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.  
VERTICAL DRILLS. Self-feeding.  
MULTIPLE DRILLS. 2 to 20 Spindles.  
HORIZONTAL BORING AND DRILLING MACHINES.  
HAND DRILLS. CAR BOX DRILLS.  
SPECIAL DRILLS. For Special Work.

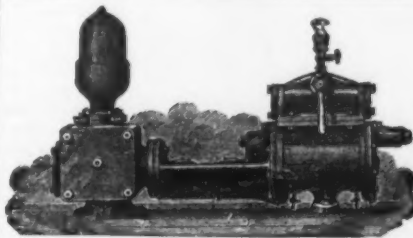
**THE CLARK MFG CO.** MANUFACTURERS OF  
BUILDERS' HARDWARE  
BUFFALO, N. Y.

# Air Compressors.



**THE NORWALK IRON WORKS CO., South Norwalk, Conn.**

**A. S. CAMERON'S  
PATENT**



**"SPECIAL" STEAM PUMP**

Is the Standard of Excellence at Home and Abroad.

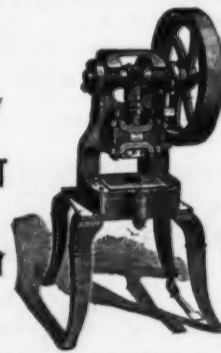
For reduced price lists address **A. S. CAMERON, East 23d Street, New York.**

**E. W. Bliss, BLISS & WILLIAMS,**  
MANUFACTURERS OF ALL KINDS OF  
**PRESSES and DIES.**



Also Manufacturers of  
SPECIAL MACHINERY

FOR  
WORKING SHEET  
METALS, &c.  
FRUIT & other  
CAN TOOLS.



Plymouth, Pearl and  
John Streets,  
**BROOKLYN, N. Y.,**  
U. S. A.



PARIS EXPOSITION, 1878.

**MANNING, MAXWELL & MOORE,**

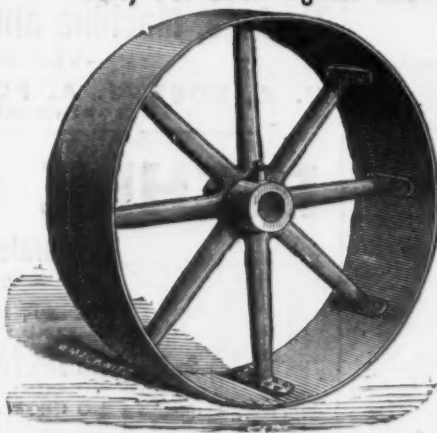
Sole Sales Agents for **THE MORSE TWIST DRILL AND MACHINE CO.'S**

Manufacture of Patent Machine Relieved Nut, Hand,  
Blacksmith and Machine Screw Taps, Screw Plates, Tap  
Wrenches and Patent Relieved Pipe Taps and  
Pipe Reamers; also of Solid Bolt and Pipe Dies.  
Furnished in V. U. S. Standard and Whitworth  
shape of threads.

**111 Liberty Street, NEW YORK.**

**THE MEDART PATENT WROUGHT RIM PULLEY.**

Forty Per Cent. Lighter and 100 Per Cent. Stronger



than any cast pulley. No shrinkage  
strains; perfectly balanced for high  
speeds; better surface for belt, and  
**THE BEST PULLEY IN  
THE MARKET.**

We make these Pulleys from 12 inches  
to 6 feet diameter, 34-inch face, crown-  
ing or straight, split or whole, single or  
double arms.

SEND FOR PRICE LIST.

Mill Gearing, Iron and Brass Cast-  
ings, and Finished Fly Wheels.

Hill, Clarke & Co., 36 Oliver St., Boston, Mass.

**The Hartford Engineering Co.,**

**HARTFORD, CONN.**

Sole licensed manufacturers for the  
New England, Middle and Atlantic  
Coast States.



**Ludlow Valve Mfg. Co.,**

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vall Ave., Troy, N. Y.

**VALVES.**

Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.,  
for Gas, Water and Steam. Send for Circular.

**Also FIRE HYDRANTS.**



**WICKERSHAM & CO.,**

MANUFACTURERS OF

Railway, Miners', Mill & Machinists' Supplies

W. & Co.'s Packing: Steam, Hydraulic and Locomotive. Sam-  
ples sent free.

Lubricants for Engines, Shafting, &c.; Rolling Mill, Railroad,  
Gear and Axle Grease.

Also, Star Cylinder Oils.  
Samples sent free for trial upon application.

No. 309 Race Street, Philadelphia, Pa.

**COCHRANE & CO., Agents, 93 Fourth Ave., Pittsburgh.**

**RIVAL  
STEAM PUMPS**  
THE  
CHEAPEST  
AND THE  
BEST  
FOR  
HOT & COLD  
WATER  
\$35.00  
UPWARDS.  
15 SIZES  
MANUFACTURED BY  
**JOHN H. MCGOWAN & CO.**  
CINCINNATI

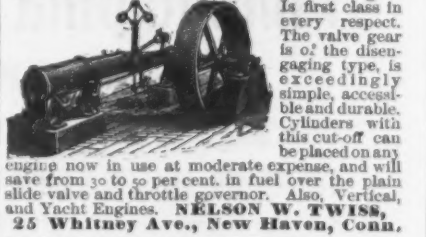
**DEAD-STROKE POWER HAMMERS.**



**DIENELT & EISENHARDT,**  
MAKERS.

1310 Howard St., Philadelphia.

The Twiss Patent Automatic Cut-off Engine



**CRANE BROTHERS MANF'G. CO.,**

**CHICAGO.**

MANUFACTURERS OF

WROUGHT IRON PIPE,

STEAM PUMPS,

STEAM and GAS FITTINGS.

Steam and Hydraulic

Freight and Passenger Elevators

STEAM HOISTING ENGINES

for Furnaces, Mines, &c.

Stationary Steam Engines &c



Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.

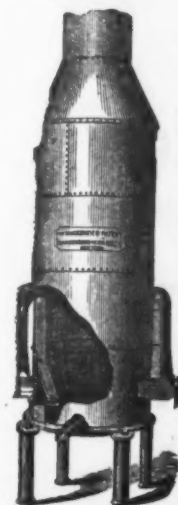


For Round, Flat or Square Iron,  
ALSO,  
Polishing & Buffing Machinery,  
**HYDRAULIC JACKS,**  
To raise from 2 to 120 tons.  
**HYDRAULIC PRESSES,**  
For special and general use.  
**HYDRAULIC HAND & POWER PUMPS**  
with 1 to 6 plungers, to run hydraulic presses, with  
either uniform or changeable speed.  
Second-hand Presses.  
**E. LYON & CO.,**  
470 B Grand Street,  
NEW YORK.  
Send for circular of what you want.

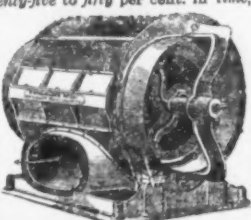


THE MACKENZIE PATENT  
CUPOLA & BLOWER.

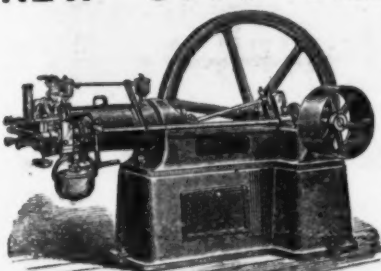
Send for circular to  
**Smith & Sayre Mfg. Co.,**  
PROPRIETORS, 245 Broadway, New York.



This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tapers, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and enables possible amount of power, and in combination with the continuous tapers causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 20, or 25 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



NEW OTTO SILENT GAS ENGINE.

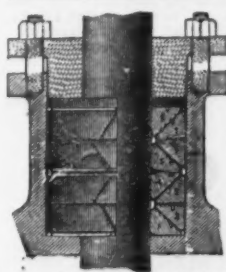


Working Without Boiler, Steam,  
Coal, Ashes or Attendance.  
Started Instantly by a Match, it gives Full  
Power Immediately.  
When Stopped, all Expense Ceases.  
No explosions, no fire nor cinders, no gauges, no  
pumps, no engineer or other attendant while running. Recommended by insurance companies.  
UNSURPASSED IN EVERY RESPECT for hoisting  
in warehouses, printing, ventilating, running  
small shops, &c.  
No. 4 and 7 H. P. and upwards. Built by  
**SCHLEICHER, SCHUMM & CO.,**  
Engineers and Machinists,  
3045 Chestnut Street, Philadelphia.

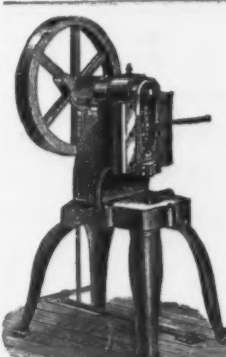
PUNCHING & SHEARING PRESSES.



DRILL PRESSES.  
Power, Foot or Hand  
Punches, and Shears; all  
sizes, from \$25 to \$5,000.  
Bar-Iron Shears, cut 1/2 x  
3 in.; weight, 275 lbs. \$65;  
New Upright Power Drills,  
bevel gears, steady  
return motion, swing 22  
in., with countershaft,  
weight 300 lbs., price  
\$95. Small size, drills  
up to 1/2 in., lever feed,  
swing 13 in., tight and loose  
pulleys (no countershaft  
required), \$25.  
**Peerless Punch and  
Shear Co.,**  
115 W Liberty Street,  
NEW YORK CITY.

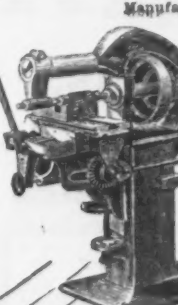


**KATZENSTEIN'S**  
Self-Acting Metal  
Packing,  
For Piston Rods, Valve  
Stems, &c.,  
Of every description.  
For Steam Engines,  
Locomotives, Pumps,  
&c., &c.  
Adopted and in use by  
the principal Iron  
Works and Steamship  
Companies within the  
last eight years in this  
and foreign countries.  
For full particulars  
and references send  
inquiries to  
**L. KATZENSTEIN & CO.,**  
35 Desbrosses St., New York.



**A. H. MERRIMAN,**  
Meriden, Conn.,  
Manufacturer of all Descriptions of  
**PRESSES.**  
Catalogue and prices sent on application.

E. E. GARVIN & CO.,



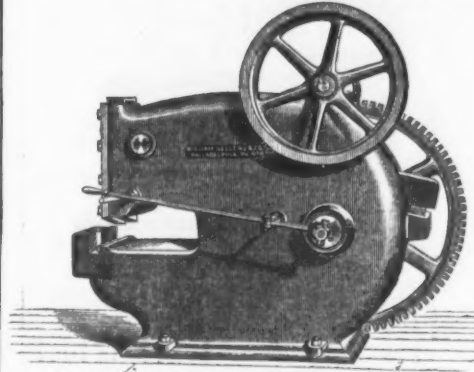
Manufacturers of  
**Milling Machines, Drill Presses,**  
Plan Lathes, Tapping Machines, Cutter  
lathes and Wood Planers. Milling Cut  
ters and Milling in all its branches.

139-143 CENTRE STREET,  
CORNELL'S BUILDING, NEW YORK.  
Send for Illustrated Catalogue.

THE BEST **NUT TAPPING MACHINE**  
LATEST IMPROVEMENTS  
**PURDY MACHINE CO.**  
Send for Circular.

Machinery, &c.

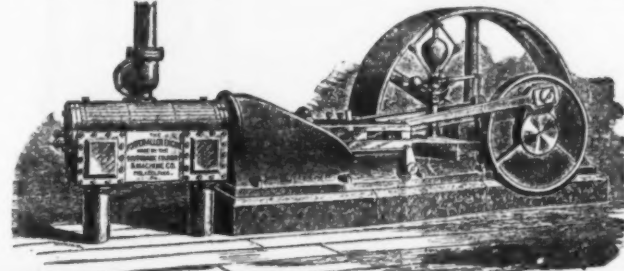
**WILLIAM SELLERS & CO.,**  
PHILADELPHIA.



Manufacturers of  
**Iron & Steel Work-  
ing Machinery,**  
**MACHINISTS' TOOLS,**  
**SHAFTING,**  
**GEARING, &c.,**  
**INJECTORS.**  
Shearing Machine.  
**BRANCH OFFICE, 79 Liberty Street, New York.**

THE  
**PORTER-ALLEN HIGH-SPEED STEAM ENGINE**

W. H. MERRICK, Pres. and Treas. C. T. PORTER, Vice-President.  
G. A. BOSTWICK, Secretary. C. B. RICHARDS, Superintendent.

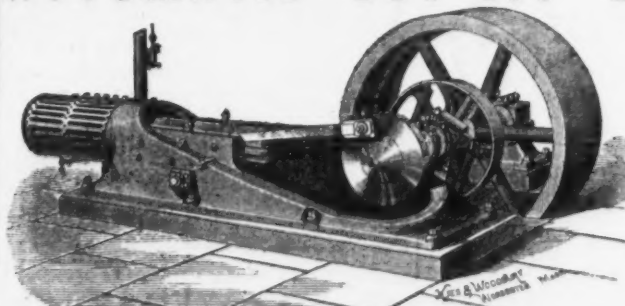


Belts and gearing dispensed with for any speed up to 600 revolutions per minute. Especially  
adapted to Rolling Mill work, Factories and Electric Light Machines.  
Having extensive foundry facilities, the company are prepared to contract for  
**IRON AND BRASS CASTINGS.**  
With largely increased facilities we are prepared to fill all orders for the Porter-Allen High-Speed  
Engine on contract time. Prices and terms will be furnished on application.  
Business communications, to receive prompt attention, must be addressed to the company.

**THE SOUTHWARK FOUNDRY AND MACHINE CO.,**  
430 Washington Avenue, Philadelphia.

STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.  
SEND FOR CIRCULARS. **CLEM & MORSE,** LATEST PATENTED IMPROVEMENTS.  
Manufacturers and Builders of  
**ELEVATORS,**  
Hoisting Machinery, Automatic Hatch Doors, &c.  
413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK.

**THE HARTFORD  
AUTOMATIC CUT-OFF ENGINE.**

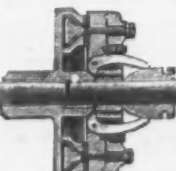


Built for Heavy  
and Continuous  
Work, and adapted  
to Any Re-  
quired Speed,  
with Close Reg-  
ulation and best  
attainable Econ-  
omy of Fuel.  
Circular and Prac-  
tical Treatise on  
Steam Engineering  
sent on application.

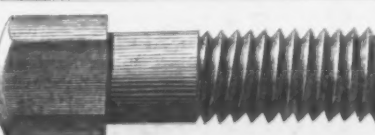
**The HARTFORD ENGINEERING COMPANY,**  
HARTFORD, CONN.  
NEW YORK OFFICE, - - ROOMS 72 and 73, ASTOR HOUSE.

**Solid Drawn Steel Tubes**  
WITHOUT A WELD.

Suitable for Hydraulic Work, Boring Rods, Sockets, Axles, Collars,  
Bushings, Ferrules, Sieves, &c., &c. Smoothly finished inside and out.  
From 1/4 in. to 4 1/2 in. outside diameter, and Walls 1-16 to 1-8 in. thick.  
IMPORTED ONLY TO SPECIAL ORDER.  
**PHILIP S. JUSTICE & CO.,**  
14 N. 5th St., Philadelphia.



**Hoisting Engines & Elevators** Safe, Durable and Reasonable in price.  
**Friction Clutch Pulleys and Cut-off Couplings.**  
We manufacture the "Giant Friction Clutch Pulley," known as the "Captain,"  
is the BEST IN THE WORLD for connecting the gear of calender rolls,  
hoisting coal, logs or freight. Our Clutch can connect any amount of power, at  
any speed, without slacking the motive power in the least, and gives no shock,  
is easy to slip and unslip; in fact, this is the only Clutch that can do heavy work  
satisfactorily.  
**D. FRISBIE & CO., 123 N. Fourth St., Phila., Pa.**

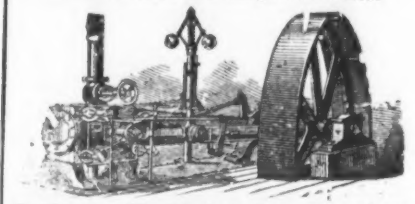


**JOHN FELLOWS,**  
Manufacturer of  
**SCREWS, NUTS & BOLTS,**  
Plane Hardware, Agraffes and Novelties in Metal.  
Wholesale and Retail Dealer in  
**IRON, STEEL & BRASS**  
No. 70 Broadway, Brooklyn, E. D.

**MACHINISTS' SUPPLIES.**

Machinery, &c.

**Corliss Engine Builders,**  
With Wetherill's Improvements.



Engineers, Machinists, Iron Founders  
and Boiler Makers.  
**ROBT. WETHERILL & CO.,** Chester, Pa.

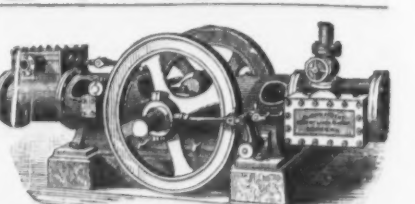
**STOW FLEXIBLE SHAFT CO., Limited,**  
5th & Pennsylvania Ave.,  
PHILADELPHIA, PA.,  
Manufacturers of  
**Portable Drilling,  
Tapping, Reaming  
and Boring  
Machines.**  
Also, Tools  
for Emery  
Wheel Grind-  
ing, Metal &  
Wood Polish-  
ing, Cattle  
Brushing &  
Clipping, &c.



**PHILA. SHAFTING WORKS.**  
GEO. V. CRESSON,  
18th & Hamilton Sts.,  
PHILADELPHIA.  
**SHAFTING  
& SPECIALTY.**  
Manufacturers of  
Shafting, Pulleys,  
Hangers, Couplings,  
and every appurte-  
nance used in the  
TRANSMISSION OF  
STEAM POWER.



**COX & SONS' NEW VERTICAL ENGINES.**  
From 1 to Sixteen Horse Power.  
Established 1867.  
**Edwin Harrington & Son**  
MANUFACTURERS OF  
PATENT EXTENSION AND  
SCREW CUTTING  
**LATHES,**  
Iron Planers,  
Radial, Upright, Suspension  
Multiple and Lever  
**DRILLS,**  
and a variety of other  
MACHINISTS' TOOLS  
Patent  
Double Chain Screw  
Pulley Blocks,  
unrivalled for Durability,  
Safety and Power.  
Patent Double Chain  
Quick-Lift Hoists,  
with Brake for quick and easy  
lowering.  
Circulars furnished.  
WORKS AND OFFICE,  
Cor. N. 10th and Penna. Ave  
Philadelphia, Pa., U.S.A.  
Represented by J. G. MAY  
N.B. 10 Liberty Street, N. Y.  
C. E. KIMBALL, 128 Oliver St.  
Boston.



**AIR COMPRESSORS.**  
**ALLEN'S  
HIGH-SPEED AIR COMPRESSORS**  
With Positive Moving Valves.  
Allen Engines, Stationary and Marine Boilers,  
Hoisting Machinery. Also, Patent Evaporators  
and Condensers for Animal Matters.  
**AIR COMPRESSORS A SPECIALTY.**  
**JOHN McLAREN,**  
River Street, - - HOBOKEN, N. J.

**CHARLES W. ERVIEN & CO.,**  
Engine Builders, Boiler  
Makers and  
**GENERAL MACHINISTS,**  
IRELAND STREET, PHILADELPHIA.

**Print Your Own** Cards, Labels,  
&c. PRESS. LARGER SIZE,  
8 1/2 x 11 other sizes. For business,  
pleasure, old or young. Every  
thing easy by printed instructions.  
Send two stamps for Catalogue of  
Presses, Type, Cards, &c., to the  
factory.  
**REAR & CO., Meriden, Ct.**



**TUBAL SMELTING WORKS.**

760 South Broad Street, PHILADELPHIA.

**PAUL S. REEVES,**

MANUFACTURER OF

**ANTI-FRICTION METALS.**CAR & MACHINERY BRASSES, INGOT BRASS  
AND SOLDER, WHITE BRASS.

Old Metals and Brass Turnings Wanted.

ESTABLISHED 1842.

**WM. & HARVEY ROWLAND,**  
PHILADELPHIA.

P. O. Address: Frankford, Philad'a. } MANUFACTURERS OF ALL KINDS OF

**Elliptic, Platform AND C Springs,****"Brewster Side Bar Combination  
Patented" Springs.**

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.  
BESSEMER SHOVEL AND PLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.**STEEL  
CASTINGS**FROM 1-4 TO 10,000 LBS. WEIGHT.  
True to pattern, sound and solid, superior in strength, toughness and  
durability to iron forgings in any position, or for any service what-  
ever. Bearing of all kinds. Shoes, Dies, Hammerheads, Crossheads  
for Locomotives, etc. 15,000 Crank Shafts and 10,000 Gear wheels of  
this steel now running prove its superiority over any other steel cast-  
ings. CRANK SHAFTS, CROSSHEADS AND GEARING ARE SPE-  
CIALTIES. Circulars and Price Lists free.  
Address  
**CHESTER STEEL CASTINGS CO.,**  
Works, Chester, Pa. 407 Library St., Philadelphia.**IMPROVED STEEL CASTINGS.**

Under Hainsworth's Patents.

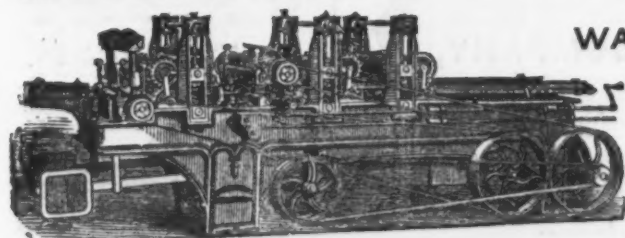
We make Castings practically free from blow-holes, of steel which is as soft and as  
easily WORKED AND WELDED as Wrought Iron, yet is STIFF, STRONG and DURABLE, with a  
TENSILE STRENGTH of not less than 65,000 lbs. to the square inch. In short, our CAST-  
INGS UNITE THE QUALITIES OF STEEL AND WROUGHT IRON.Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all  
descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landslides.

WE USE NO CAST IRON.

Send for circular.

**PITTSBURGH STEEL CASTING CO.,**  
PITTSBURGH, PA.**Punching Presses**

DIES AND OTHER TOOLS

For the manufacture of all kinds of  
SHEET METAL GOODS,  
DROP FORGINGS, &c.  
Stiles & Parker Press Co.,  
Middletown, Conn.**Wood-Working Machinery.**

WAREROOMS

172 High Street,  
BOSTON.

FOR

Railroad Shops, Planing Mills, Car Builders, Cabinet,  
Carriage, Sash, Door and Blind Makers.

We also deal in all kinds of

MACHINERY AND SUPPLIES.

**S. A. WOODS MACHINE COMPANY,** 91 Liberty Street,  
NEW YORK.  
Illustrated catalogues on application.**INDIANA FOUNDRY COMPANY, Indianapolis, Indiana.**MANUFACTURERS OF ALL KINDS OF CASTINGS.  
FINE  
CASTINGS  
JAPANNED,  
BRONZED,  
COPPERED,  
ANNEALED.**DROP****Merrill Brothers,**  
26 First Street,  
BROOKLYN, N. Y.HAMMERS,  
FORGINGS and  
POWER PRESSES.**WOOD, JENNISON & CO.,**  
Manufacturers of SHAFING, PULLEYS AND HANGERS—A Specialty.  
Also, Wood's Patent Bolt Threading Machine. Worcester, Mass.**STANLEY G. FLAGG & CO.**

PHILADELPHIA, PA.

Office and Works,

N. W. cor. 19th St. &amp; Pennsylvania Ave.

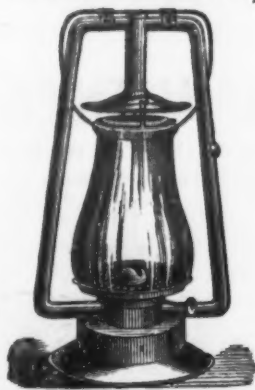
Manufacturers of

**STEEL CASTINGS.**A Substitute for Steel & Wrought Forgings  
Circulars sent on application.**Steel Castings.**Light and heavy Steel Castings of superior  
metal, solid and homogeneous. All work guaran-  
teed. Send for circular.**EUREKA CAST STEEL CO.,**

Chester, Pa.

Office: 307 Walnut St., Phila.

THE GENUINE

**No. 0 Tubular  
LANTERN,**

With and without Guards,

Is Manufactured by

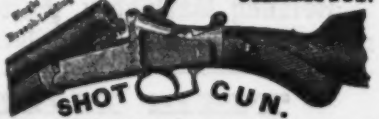
**R. E. DIETZ,**

54 &amp; 56 Fulton St., NEW YORK.

**COLUMBIA BICYCLE**The Bicycle, as a permanent,  
practical road vehicle, is an  
acknowledged fact, and the  
thousands in daily use are  
constantly increasing in num-  
bers. It combines speed and  
endurance that no horse can  
equal, and for pleasure or  
health is far superior to any  
other out-door sport. The art  
of riding is easily acquired,  
and the exercise is recom-  
mended by the medical pro-  
fession as a means of renew-  
ing health and strength, as it  
brings into action almost  
every muscle of the body.  
Send for stamp for separate il-  
lustrated catalogues, contain-  
ing price lists and full infor-  
mation.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New Model, Top Snap, **CHAMPION**It has a Patent Top Snap Action, by means of  
which the gun can be opened by pressing the lever either to  
the right or left, an improvement found in no other gun. It  
has the **Rebounding Lock**, which ensures safety in  
loading beyond a doubt. The other improvements are the  
Patent Grip Stock, and the Patent Fore-End  
Fastening. By means of the Patent Fore-End Fastening  
the barrel can be detached from the stock in an instant, and  
as quickly replaced. The shells used in this gun are the cen-  
tral fire, paper or brass. The brass shells can be reloaded  
many times. Prices: 1 Plain Barrel, 12 bore, \$12.00; 1 Plain  
Barrel, 10 bore, \$11.00; 1 Plain Barrel, 12 bore, \$12.00; 1 Plain  
Barrel, 10 bore, \$11.00. Address  
JOHN F. LOVELL & SONS, Gun Dealers, Boston, Mass.  
Send stamp for Illustrated CatalogueBUFFALO BLACKSMITHS' BLANKS  
& PORTABLE FORGES

FOR SALE BY ALL DEALERS

BUFFALO FORGE CO. MFRS

BUFFALO, N. Y.

SEND FOR CIRCULAR &amp; PRICE LIST

Light Soft Gray Iron

**CASTINGS**

METAL PATTERN MAKING.

**THE CRAIGHEAD & ELWELL**

MANUFACTURING CO.

33 Barclay Street and 35 Park Place.

FACTORY, BRIDGEPORT, CONN.

John McLean,

Manufacture of

Ayr's Hydrants.

Stop Cocks &amp; Gauges

Lead Cemetery Supplies.

225 &amp; 226 Monroe St., N. Y.

**TACKLE BLOCKS.**

Rope and Iron Strap of all kinds. Lig-

num vitae Wood for Ten-Pin Balls.

**Wm. H. McMillan & Bro.,**

Office, 112 South Street, New York.

Factory, 39 to 40 Penn St., Brooklyn, N. Y.

**AIR COMPRESSORS.**

PRICES REDUCED. SEND FOR NEW CATALOGUE.

**CLAYTON STEAM PUMP WORKS,**

14 AND 16 WATER STREET, BROOKLYN, N. Y.

**Scranton Brass Works,****J. M. EVERHART,**

Manufacturer of

**BRASS WORK,**

For Water, Gas &amp; Steam. Also

Carr &amp; Wilcox's Patent Cut Files.

Will cut faster, wear longer, and clog

less than any file in the market.

ONE Street, SCRANTON, PA.

**RUSSELL, BURDSALL & WARD,**

PORTCHESTER, N. Y.,

MANUFACTURERS OF

**CARRIAGE, TIRE, PLOW, STOVE & OTHER BOLTS.**

Carriage Bolts made from Best Square Iron a Specialty.

**JOHN RUSSELL CUTLERY CO.,**

Green River Works,

MANUFACTURERS OF

**Table and Pocket Cutlery,**

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' &amp; HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

New York Office.

25 Chambers Street.



Factories,

Turners Falls, Mass.

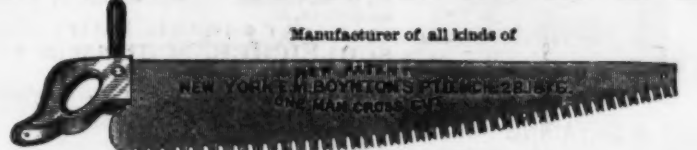
**F. W. WURSTER,**  
IRON FOUNDRY  
AND AXLE WORKS,130 to 142 First St.,  
Brooklyn, N. Y.**AXLES**SUPERIOR  
WAGON, CART AND  
TRUCK AXLES.Our facilities enable us to quote the  
trade lower prices than any other  
manufactory. Send for price list.**J. M. CARPENTER**

PAWTUCKET, R.I.

MANUFACTURER OF TAPS AND DIES.

**E. M. BOYNTON,**

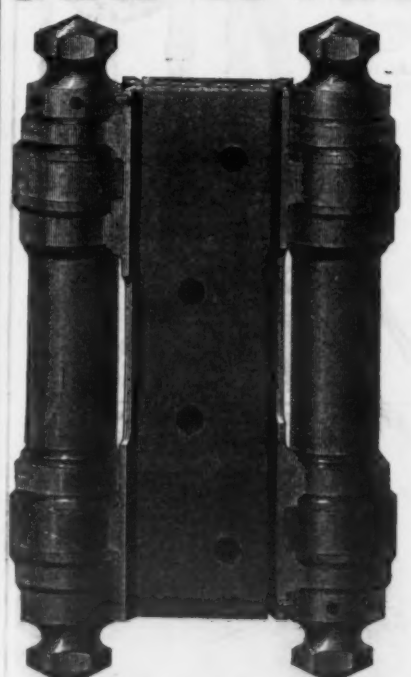
Manufacturer of all kinds of

**First-Class Saws, Frames, Cross-Cut Handles****TOOLS, FILES, &c.**

Also sole Proprietor and Manufacturer of the

**GENUINE PATENT LIGHTNING SAW**

80 Beekman Street, NEW YORK.

I have during the year added to my extensive facilities the construction of a new Saw Manufactory  
100 feet by 90 feet, comprising 36, 38, 40 and 42 Devise street. I have purchased costly land and erected  
an additional four-story brick manufactory, in order to fill special orders for my rapidly increasing busi-  
ness. The new addition comprises about 9,000 feet of floor space, filled with the latest improvements  
in automatic machinery for saw manufacturing. For grinding circular saws I have a new machine,  
admitted to be unsurpassed in accuracy and speed. I have also three horizontal machines for grinding  
cross-cuts, mill saws, hand saws, buck-saws, &c., with capacity for over 1000 saws per day.I have added extensive File Works, but shall make only best hand-cut Files, as in filing saws I find  
them the cheapest at the higher cost. I can fill special orders, and shall expect at all times to have on  
hand, at my store, 80 Beekman Street, New York, a few thousand dozen each Hand Saws,  
Cross-cuts and Files, Saw Sets, Patent Handles, &c.**GEM SPIRAL SPRING  
HINGES.**

Size.	For Doors.	No.	Per Pair.	No.	Per Pair.
3 in.	1 to 1 1/2 in.	63	\$0.80	83	\$1.60
4 "	1 " 1 1/2 "	64	1.00	84	2.00
5 "	1 " 1 1/2 "	65	1.25	85	2.50
6 "	1 " 1 1/2 "	66	1.75	86	3.50
7 "	1 1/2 " 1 1/2 "	67	2.25	87	4.50
8 "	1 1/2 " 2 1/2 "	68	3.25	88	6.50
10 "	1 1/2 " 2 1/2 "	69	4.50	89	9.00

LIBERAL DISCOUNTS.

Send for Catalogue to

**VAN WAGONER & WILLIAMS,**

MANUFACTURERS OF

SPRING HINGES for Screen and Panel Doors and Show Cases.

And a full line of the best ROD and COIL DOOR SPRINGS,

82 BEEKMAN STREET, - - NEW YORK.

**BALTIMORE RIVET AND SPIKE WORKS.**Rivets,  
Spikes,  
Bolts,  
Nuts,Washers,  
Bolt Ends,  
Wood Screws,  
Track Bolts.**WM. GILMOR of WM., cor. President & Fawn Sts.**